



**KNOWLEDGE MANAGEMENT CAPABILITY IN NURSING CARE
PERFORMANCE IN SELECTED TEACHING HOSPITALS
IN SOUTH-WEST, NIGERIA**

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DECLARATION

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DEDICATION

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ABSTRACT

This study investigated knowledge management (KM) capability in nursing care performance in selected teaching hospitals in South-west, Nigeria. The specific objectives of the study were: to investigate the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria; investigate the relationship between knowledge infrastructure and knowledge process in KM capability; and examine how KM capability can be leveraged to support nursing care performance outcomes.

The study was underpinned by pragmatic paradigm which combines both quantitative and qualitative research methods. A survey research design was employed along with convergent mixed methods design to conduct the research. The sample of the study comprised of registered nurses working in the various clinical units of the selected teaching hospitals in the South-west region of Nigeria. The selected teaching hospitals are University College Hospital, Ibadan and Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife. Proportionate stratified sampling was used for quantitative data collection using questionnaires, while a purposive sampling method was used for qualitative data collection using semi-structured interviews. The questionnaire was administered to 320 registered nurses, 298 (93.13%) of whom returned the questionnaires. Semi-structured interviews were also conducted with 9 Deputy Directors of Nursing Services (DDNS) from both hospitals. To ensure reliability and validity of the results, an item-total correlation, and principal component analysis (PCA) was applied on the pre-tested questionnaire, while the internal consistency and reliability was also checked by applying Cronbach's Alpha (α) Coefficient. The result of the pilot study showed that the research instruments were valid and reliable. The data collected from the main study were initially analysed for missing values, sample, descriptive and normality testing using SPSS version 22.0 with a final number of 298 responses. The two-step approach to structural equation modelling (SEM) was then applied using AMOS version 22.0. The structural models were developed to test the hypothesised relationships and answer the research questions.

The findings indicated that there were more females compared to males in the two teaching hospitals. The majority of the respondents from the two teaching hospitals were between the ages of 31-35 years. The highest qualification held by the nurses is the basic registered nurses (RN) certificate. The findings revealed that most of the younger registered nurses between the ages of 21-30 years from the two teaching hospitals had spent between 1-5 years in the

profession. On the other hand, the older nurses between the ages of 46-55 years were found to have more work experience.

The findings of the study established that information technology was found to have significant influence on nursing care performance, while organisational culture and organisational structure was not a significant predictor of nursing care performance. However, the indirect positive effects were confirmed by the data. The results also indicated that knowledge process positively influenced nursing care performance.

The study revealed that information technology, organisational structure, and organisational culture in KM infrastructure are found to influence KM process positively and significantly (knowledge acquisition, conversion, application, and protection) in the two teaching hospitals. The study further revealed that the combined relationship between the dimensions of knowledge infrastructure (information technology, organisational structure, and organisational culture) and knowledge process strongly and significantly influence nursing care performance in the teaching hospitals.

In leveraging knowledge management capability to support nursing care, the identified challenges in the study were: lack of knowledge management policy; paucity of information technology infrastructure; lack of information technology support for the nurses; shortage of nurses; out-dated and obsolete equipment; dilapidated infrastructure; inconsistent supply of consumables and materials; power failure and erratic electricity; insufficient budget from the Federal Government; lack of motivational incentives; inadequate working conditions and poor salary. Some of the solutions proffered were provision of adequate financial resources and replacement of out-dated equipment by the government; implementation of information technology facilities; provision of consistent power supply and employment of more skilled nurses, while ensuring continuous re-training.

The study concluded that the performance of the registered nurses is primarily informed by the influence of information technology support, type of organisational culture and organisational structure of the teaching hospitals. Based on the findings of the study, the recommendations are made in the following areas: knowledge management policy, investment in information technologies (IT), knowledge management infrastructure, knowledge management strategies,

change management, top management support, knowledge management measurement, and training.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADNS	Assistant Director of Nursing Services
AKISs	Agricultural Knowledge and Information Systems
AMOS	Analysis of Moment Structures
AP	Acquisition Process
APP	Application Process
ACNO	Assistant Chief Nursing Officer
CA	Competitive Advantage
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMIN/DF	Chi-square dividing by Degree of Freedom
CNO	Chief Nursing Officer
CP	Conversion Process
CR	Composite Reliability
DDNS	Deputy Director of Nursing Services
DF	Degree of Freedom
ENT	Ear, Nose and Throat
FMoH	Federal Ministry of Health
GFI	Goodness of Fit Index
ICN	International Council of Nurses
ICT	Information and Communication Technology
IT	Information Technology
KBV	Knowledge-based View
KIC	Knowledge Infrastructure Capability
KM	Knowledge Management
KMO	Kaiser-Meyer-Okin
KPC	Knowledge Protection Capability
LAUTECHTH	Ladoke Akintola University of Technology Teaching Hospital
NCPF	Nursing Care Performance Framework
NO	Nursing Officer
NP	Nursing care Performance

OAUTHC	Obafemi Awolowo University Teaching Complex
OC	Organisational Culture
OS	Organisational Structure
PCA	Principal Component Analysis
PP	Protection Process
PRRINN	Programme for Reviving Routine Immunization in Northern Nigeria
RBV	Resource-based View
RQ	Research Questions
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error of Approximation
RNs	Registered Nurses
SEM	Structural Equation Modelling
SNO	Senior Nursing Officer
SP	Sample Population
SPSS	Statistical Packages for Social Sciences
UCH	University College Hospital

CHAPTER ONE

INTRODUCTION

1.1 Context of study

Knowledge is a valuable strategic asset for organisation's capability with the potential to influence future actions (Alavi and Leidner, 2001). The utilisation of knowledge as a strategic resource has been of interest to academics, researchers and the public for the past several decades. The possession of knowledge is not important, but rather the ability to apply and leverage knowledge for attaining organisational objectives and enhancing performance. Therefore, for organisations to make optimal use of its value, it is important to effectively manage and apply knowledge (Omotayo, 2015).

In healthcare organisations, various studies have been carried out to investigate how the quality of care and patient outcomes can be improved (Simon, 2016). Furthermore, researchers have paid a great deal of attention to how nursing care delivery can be more efficient and effective. Teaching hospitals use hospital information systems (HIS) incorporating nursing job manuals, clinical pathways and guidelines to improve the quality of nursing care (Lee, Kim and Kim, 2014). This is motivated by the fact that the sheer amount, fragmentation, and rapid explosion of knowledge make it impossible for nurses to access all the available knowledge (Tsai, 2014). The availability of accurate, timely, reliable, and relevant clinical knowledge is essential for nursing practices because of its tremendous benefits for improving efficiency and increasing the quality of nursing care.

To improve nurses' productivity, nursing departments in healthcare institutions around the world have tried to implement effective knowledge management in the assessment of patient procedures and evidence-based nursing care as well as in different professional guidelines and protocols (Bohmer, 2009). Therefore, according to Ajanaku (2018:1) "it is critical for health care systems to look for innovative solutions, as well as to develop strategies that aim to manage and utilize nursing knowledge to improve performance in providing effective and quality patient care". Central to the current study is the fact that there is a dearth of literature on knowledge management (KM) from the perspective of nursing care in Nigeria. Additionally, relatively few studies have focused on knowledge management practices in nursing care delivery in the healthcare sector.

Studies from other developed countries reported that the implementation of knowledge management in organizations lead to improved performance (Hsu, 2008; Choi 2011). However, in the context of developing countries such as Nigeria, KM is still in the early stages of maturity due to infrastructural deficits. In agreement. Suraj and Ajiferuke (2013) reported the dearth of literature on KM research in Nigeria. Consequently, this empirical study is aimed at determining the capabilities of knowledge management in nursing care in the context of Nigeria.

This chapter introduces the background of the study and lays the foundation for subsequent chapters. It begins with an outline of the research background and research problem. The research objectives and questions are summarized followed by the research hypotheses, and the research model drawn from the literature review and theory. The chapter also provides an overview of the theory, literature review, and methodology. Finally, the key terms used in the study are outlined, as is the structure of the rest of the thesis.

1.1.1 Background to the Study

Knowledge has become a vital commodity to countries, businesses and individuals in the evolving knowledge-based economy (Kefela, 2010). Teece (1998) cited in Ajanaku (2018) highlighted that the emergence of the knowledge-based economy has placed a premium on knowledge as a tool for performance in organisations. According to Stewart (2001), the knowledge-based economy stands on three pillars: first, knowledge has become what we buy sell and do; second, knowledge-based assets have become more important to organisations; third, in order to prosper new management techniques, new technologies and raw strategies are needed to explain knowledge-based assets.

For better exploitation of knowledge for business benefits, many organisations are launching knowledge management initiatives believing that their well-intended effort will yield improved performance (Haslinda and Sarinah, 2009). The importance of knowledge has been discussed by many management scholars and authors. Notable contributions include, but are not limited to: Cohen and Levinthal (1990); Drucker (1993); Nonaka (1994); Blackler (1995); Grant (1996); Wiig (1997); Davenport and Prusak (1998); Bhatt (2000); Alavi and Leidner (2001); Tiwana (2002); Nonaka and Takeuchi (1995); Okunoy and Bertaux (2008); Anderson (2009); Nguyen (2010); Ringel-Bickelmaier and Ringel (2010); Ferraresi et al. (2012); and Abbas

(2015). Generating knowledge continuously is essential to knowledge organisations (Dawson, 2000). The concept of treating and managing organisational knowledge as a valuable strategic asset has become quite popular and has generated substantial attention in business and management circles due to its capability in delivering to organisations, strategic results relating to profitability, competitiveness and enhancement of performance (Chua, 2009; Jeon, Kim and Koh, 2011). Therefore, knowledge is considered one of the most important resources in an organisation, because it is capable of making organisational and individual actions more intelligent, efficient, and effective.

The field of knowledge management (KM) emerged in the early 1990s within various fields including business administration, public policy, information systems management, and library and information sciences (Kothari, Hovanec, Hastie and Sibbald, 2011). Knowledge management as a field of study deals with the utilisation and development of the knowledge assets of an organisation with the view of furthering the organisation's objectives (Rowley, 1999). The goal of KM is to provide appropriate tools, technologies, strategies, and processes to turn data and information into valuable knowledge assets (Davenport and Prusak, 1998). McCann and Buckner (2004) further asserted that the intention of KM is to link and to develop internal capabilities to meet both the current and future needs of an organisation. Furthermore, several researchers have maintained that KM leads to positive organisational performance based on the notion that knowledge is the key organisational asset (Foss and Mahnke, 2003).

While the KM discourse has existed for many years in the private sector (Swan and Scarborough, 2003), the healthcare sector has just recently been applying it due to the explosive volume of knowledge that health care practitioners must handle. KM has become an imperative part of the daily work in healthcare practices (El Morr and Subercaze, 2010) and has penetrated the fabric of organisational and managerial processes in the healthcare sector (Nicolini et al., 2008). In the context of healthcare deficiency and growing demands for health services, generating organisational strategies to improve and manage knowledge in nursing practice is imperative. Developing these strategies necessitates an understanding of what kind of knowledge is essential and the impact it has on patients' health (Siu, 2015).

While several studies have been carried out on KM in healthcare organisations in general, specific attention has not been given to the knowledge management practices among the nursing professionals especially from the developing countries context (Ajanaku, 2018). The

productivity of the healthcare institutions is impacted by the nursing workforce, which constitutes the greatest portion of healthcare professionals (ICN, 2006) and play a vital role in the provision of effective and efficient patient care (Needleman and Hassmiller, 2009). It is universally acknowledged that nursing care practice can be highly-knowledge intensive. Nurses are the key contacts for patients in all healthcare settings and therefore they have a direct link to organisational performance, as their knowledge is important for decision-making in daily patient care for quality outcomes (Ghosh and Scott, 2005).

The dearth of published studies on the unique perspective of KM in addressing nursing care outcomes was noted by Ghosh and Scott (2005) who observed that KM tools and processes while established in other sectors of the economy are relatively new in clinical nursing. Nursing care relies heavily on knowledge, besides delivery of care requires collaboration with other health practitioners that need to exchange their knowledge (Donnelly and Domm, 2014). Managing knowledge in clinical nursing has always been a challenge in the healthcare sector; renewed and consistent efforts are needed to manage knowledge in nursing care for improved patient outcomes (Aliyu et al., 2017). Lindrooth et al. (2015) noted that nurses create value in healthcare as a key structural component in the provision of healthcare services; and are leaders and innovators in improving processes as well as the organisational environment where healthcare services are delivered.

According to Ajanaku (2018:2), “Nigeria, a developing country in West Africa is seized with a number of challenges that make it difficult for professional nurses to effectively deliver quality patient care”. Such challenges include, but are not limited to poor infrastructure, policy issues, lack of professional retraining, and inefficient health process (Olade, 2004). Okafor (2005), Ezeugwu (2007), Okaro, Ohagwu and Njoku (2010) concur that the nurses in Nigeria lack adequate infrastructure and resources to enhance optimal patient outcomes. The major challenge therefore facing nurses working in healthcare facilities in Nigeria is to make sure that excellent and high-quality nursing care is provided to all patients on a daily basis (Salawu, 2004).

With the rapidly changing landscape of healthcare, effective management of the knowledge base of nurses is becoming vital to delivering high-quality patient care. In this regard, KM strategies should integrate fundamental factors such as IT and knowledge-friendly culture that drives KM process, an organisational structure that acknowledges motivational incentives and

rewards for knowledge sharing, group learning and the availability of responsible team leaders (Lee, Kim and Kim, 2014; Sanchez-Polo and Cegarra-Navarro 2008). An appropriate integration of these KM factors in health institutions should result in improved organisational performance. Therefore, this study sought to examine KM capability in nursing care. To place the research issues in a specific context, two teaching hospitals in the South-west: Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) and University College Hospital (UCH) were selected for empirical examination.

1.1.2 Setting of the Study Site

The South-west region is one of the six geopolitical zones in Nigeria. This region includes six states which are Lagos, Ekiti, Ogun, Oyo Ondo, and Osun states. The study area is bound in the East by Edo and Delta states, in the North by Kwara and Kogi states, in the West by the Republic of Benin and in the South by the Gulf of Guinea. It is majorly a Yoruba speaking area, although there are different dialects within the same state (Agboola, 1979).

The Nigerian healthcare system is decentralised into a three-tier structure with responsibilities of providing adequate health services at the federal state and local levels. More specifically, the federal government level through the federal ministry of health (FMOH) is responsible for the overall health system, the national health management system and the provision of health services through the tertiary and teaching hospitals (Nigeria Federal Ministry of Health, 2004). In most cases, the role of the Federal Government of Nigeria is coordinating the affairs of the University teaching hospitals in the health sector ensuring transparency in the organisation, while the State Government manages the various general hospitals and the local government focuses specifically on primary health care (Welcome, 2011). Neely and McInturff (1998) highlighted that teaching hospitals are widely reputed to provide high quality care including the treatment of rare diseases and complex patients, the provision of specialised services and advanced technology, and the conduct of biomedical research. Other distinctive missions of teaching hospitals include medical education and training, innovations in clinical care, particularly at public teaching hospitals (Blumenthal, Weissman and Campbell, 1997).

The selected teaching hospitals for this study are the University College Hospital (UCH) located at Ibadan, Oyo State and Obafemi Awolowo University Teaching Hospitals (OAUTHC) located at Ile-Ife, Osun State. These two hospitals are situated in the South-west

region of Nigeria. South-west region of Nigeria was purposively selected because it comprises of the largest number of registered nurses in the country as stated by Agbedia (2012). Nurses were selected out of the other health professionals because they represent the major professionals in the healthcare workforce in any country and play a pivotal role in improving the healthcare delivery of hospitals (Pappas, 2008).

The University College Hospital, Ibadan was founded in 1952 and is affiliated to the University of Ibadan as its teaching hospital. Obafemi Awolowo University Teaching Hospitals Complex (formerly Ife University Teaching Hospitals Complex) was founded in the year 1967. It is also the teaching hospital of the Obafemi Awolowo University. University College Hospital, Ibadan, is the only teaching hospital established by the Federal Government in Oyo State, while Obafemi Awolowo University Teaching Hospital is the only teaching hospital established by the Federal Government in Osun State, Nigeria. The two teaching hospitals were selected for study for a number of reasons: they are among the first generation of teaching hospitals established by the Federal Government. The two teaching hospitals deliver education and training to healthcare practitioners and health services to clients within the country and the surrounding regions in West Africa. In addition, to offering undergraduate and postgraduate nursing programs in the School of Nursing in the universities, the teaching hospitals provide facilities for the training of registered nurses in various specialties.

The two hospitals selected are public teaching hospitals. Private teaching hospitals were excluded from the study because they are just emerging and not grounded as the selected hospitals.

1.2 Statement of the Problem

In today's knowledge economy, knowledge is the vital resource to any organisation's performance. Thus, it is imperative for knowledge to be harnessed, managed, and maximised for improved productivity (Drucker, 1993). It is highly imperative for healthcare institutions such as teaching hospitals to maximise the exploitation of knowledge capital effectively given the responsibility of patient care improvement and patient safety. Health care organisations are gradually utilising knowledge management strategies to achieve organisational goals (Siu, 2015). Even though nursing care is contributing its quota to the development of health institutions, a stark reality still confronts this sector in terms of managing the knowledge of the

nursing professionals in the field. The extensive use and application of knowledge in nursing practice requires nurses to have a broad knowledge base and an optimal level of decision-making skills in providing effective and efficient patient care (De Beer et al., 2011). The state of the fragmentation of medical knowledge has made it problematic for nurses to access relevant knowledge required for patient care and has initiated a crucial need for collaboration across organisational boundaries. In addition, unfavourable corporate culture and organisational structure forms a substantial hindrance to the success of KM practices (Cruz and Ferreira, 2016). Current research has shown that the inability of nurses to access and apply current and relevant knowledge in healthcare leads to the delivery of sub-optimal care to patients (McGlynn et al., 2003). Knowledge management contributes to improving health systems services through the enhanced creation, sharing, translation, and application of knowledge (Landry et al., 2006). Therefore, it is crucial for nursing directors and hospital administrators to look for innovative solutions as well as create strategies that are targeted at managing knowledge in nursing practice.

The challenge of mobilising and utilising knowledge to improve nursing care and ensure effective use of resources by nursing professionals is a concern in health institutions in Nigeria (Ajanaku, 2018). Siemuri (2014) asserts that there is a growing concern about the poor quality of nursing care rendered to the population in Nigeria. Abdulraheem, Olapipo and Amodu (2012) pointed out that the quality of nursing care in Nigerian health institutions is affected by non-conducive and unsupportive working environments; poor leadership; inadequate health facilities and structural infrastructure; and absence of integrated systems for nursing practices. Similarly, Akpabio et al. (2016) noted that lack of organisational learning, lack of understanding of organisational process, technology, and skills hindrances affected the delivery of nursing care in Nigeria health institutions. Consequently, this situation obliges health institutions to consider initiating a proactive strategy towards new resources and capabilities to improve nursing care.

To stimulate innovation, creativity, and learning in healthcare systems, the nature of KM within the context of nursing care needs to be explored. KM practices in nursing care delivery are essential for acquiring competencies with a view of the quality of patient care. In order to understand the positive or negative outcomes of KM practices in the context of nursing care

delivery in Nigeria, the identification, and evaluation of capabilities that are necessary for nursing care performance is vital. It is against this background that the study was conceived.

Therefore, this study attempts to broaden the frontier of knowledge, by addressing the dearth of literature on knowledge management capability in nursing care in selected teaching hospitals in Nigeria. Extant literature revealed that no comprehensive study had been done on knowledge management in nursing in the selected teaching hospitals. The study focuses on this gap by providing insightful literature on KM capability in nursing care performance in selected teaching hospitals in South-west and providing new data from this sample.

1.3 Objectives of the Study

The main research objective of the current study is to determine the influence of knowledge management capability in performance of nursing care in selected teaching hospitals in South-west Nigeria.

The study addresses the following specific research objectives:

1. To investigate the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria.
2. To investigate the relationship between knowledge infrastructure and knowledge process in KM capability and the impact of the relationship on nursing care performance.
3. To examine how KM capability can be leveraged to support nursing care performance outcomes.

1.4 Research Questions

Research questions are indispensably important in mixed methodss studies because they anchor the type of research design used, the sample size and sampling scheme employed, the research instruments administered, and the data analysis techniques used (Onwuegbuzie and Leech, 2006: 475).

This study investigated the following research questions:

1. What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?
4. How can KM capability be leveraged to support nursing care performance?

1.5 Research Hypotheses

Based on the research questions, extant literature reviewed (Chapter three of this thesis) and selected constructs from the theories adopted for this study (see Chapter two of this thesis), the study sought to test the following null hypotheses:

H₀₁: Information Technology support does not have a positive influence on nursing care performance.

H₀₂: Organisational culture does not have a positive influence on nursing care performance.

H₀₃: Organisational structure does not have a positive influence on nursing care performance.

H₀₄: Knowledge Process capability does not have a positive influence on nursing care performance.

H₀₅: Information Technology is not positively related to knowledge process in KM capability.

H₀₆: Organisational culture is not positively related to knowledge process in KM capability.

H₀₇: Organisational structure is not positively related to knowledge process in KM capability.

H₀₈: The relationship between IT support and knowledge process in KM capability does not positively influence nursing care performance.

H₀₉: The relationship between organisational culture and knowledge process in KM capability does not positively influence nursing care performance.

H₀₁₀: The relationship between organisational structure and knowledge process in KM capability does not positively influence nursing care performance.

1.6 Theoretical Framework

This section provides a brief overview of the theoretical underpinning which guided the research. The full theoretical discussion is provided in Chapter 2 of this thesis (Theoretical Framework). A scientific study should be underpinned by a theoretical or conceptual framework depending on whether it is informed by a quantitative or qualitative methodology (Ngulube, Mathipa and Gumbo, 2015).

To guide the whole process of the study, Organisational Capability Theory (Gold, Malhotra and Segars, 2001) was adopted. The theory has been employed in various studies to understand knowledge management capability and organisational performance (Anderson, 2009; Cho, 2011; Khalifa and Shen, 2010). The theory has been applied in nursing care (Ghosh and Scott, 2005; Allen, 2013) and in healthcare research by Orzano et al. (2008). Organisational Capability Theory was found suitable in answering all the research questions in this study because it is grounded in social capital theory, the resource-based and knowledge-based view of the firm and it is proved to provide robust explanations in studying KM infrastructure and process in nursing care.

The theoretical framework is proposed in the study based on comprehensive literature review and theoretical model underpinning the study. The theoretical framework covers three parts and contains eight constructs as follows:

- KM infrastructure consisting of three constructs: Information Technology support, organisational structure, and organisational culture.
- KM process consisting of four constructs: acquisition, conversion, and application and protection process.
- KM effectiveness represented by one construct: nursing care performance.

Table 1.1 provides the mapping of research questions and hypotheses to variables of the theoretical model underpinning the study.

Table 1.1: Mapping of research questions to variables being investigated

S/ N	Research Question	Research Hypothesis	Key Variables of the theory	Theory
1	What are the factors of KM capability influencing nursing care performance outcomes health institutions in South-west Nigeria?	IT support does not have a positive influence on nursing care performance.	IT support, nursing care performance.	Organisational Capability Theory
		Organisational culture does not have a positive influence on nursing care performance.	Organisational culture, nursing care performance.	
		Organisational structure does not have a positive influence on nursing care performance.	Organisational structure, nursing care performance.	
		Knowledge Process capability does not have a positive influence on nursing care performance.	Knowledge Process capability, nursing care performance	
2	What relationship exists between	IT support is not positively related to knowledge process in KM capability.	IT Support, knowledge process	Organisational Capability Theory

S/ N	Research Question	Research Hypothesis	Key Variables of the theory	Theory
	knowledge infrastructure and knowledge process in KM capability on nursing care performance?	Organisational culture is not positively related to knowledge process in KM capability. Organisational structure is not positively related to knowledge process in KM capability.	Organisational culture, knowledge process Organisational structure, knowledge process	
3	How does relationship that exist between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?	The relationship between IT support and knowledge process in KM capability does not positively influence nursing care performance.	Organisational culture, organisational structure, IT Support, Knowledge process, Nursing care performance	Organisational Capability Theory
		The relationship between organisational culture and knowledge process in KM capability does not		

S/ N	Research Question	Research Hypothesis	Key Variables of the theory	Theory
		positively influence nursing care performance.		
		The relationship between organisational structure and knowledge process in KM capability does not positively influence nursing care performance.		
4	How can KM capabilities be leveraged to increase nursing care performance?		Knowledge infrastructure capability, Knowledge process capability Nursing care performance	Organisational Capability Theory

1.7 Preliminary Literature Review

The detailed discussion of the literature reviewed is discussed in Chapter 3 (Literature Review) of the thesis. The Literature is reviewed from journals, conference proceedings, theses/dissertations, books, technical reports, and internet search engines. The literature is reviewed from the context of both developed and developing countries. Furthermore, the literature is reviewed from the following themes: knowledge, knowledge management, knowledge management in nursing care, knowledge management capability, knowledge management infrastructure capability, knowledge management process capability, nursing care performance and challenges of knowledge management in nursing care.

From the reviewed literature, gaps revealed paucity of studies focusing on knowledge management in nursing care delivery and available studies were conducted in the developed countries. There is a dearth of literature on knowledge management in Nigeria and generally in the context of Africa. Existing studies seem to disregard the philosophical underpinning of a research as well as limited use of mixed methods research approach that combines both qualitative and quantitative research techniques in knowledge management research.

1.8 Summary of Methodology

This section summarises the research methodology used in the research. It discusses the research paradigm, research approach, research design sample procedures, and data collection instruments. The section further discusses the validity and reliability of the data collection instruments, data analysis and ethical consideration of the study. A comprehensive review of the research methods is presented in Chapter 4 (Research Methodology) of the thesis.

1.8.1 Research Paradigms

Based on ontological, epistemological, and methodological assumptions, research paradigms may be categorised as positivism, constructivist, critical theory, and pragmatism. The pragmatic research paradigm is the philosophical underpinning for this study. Pragmatism applies a practical approach, integrating different perspectives to help collect and interpret data. The pragmatic approach allows the use of both qualitative and quantitative research methodologies to collect information and make inquiry into complex phenomenon of social and natural contexts (Creswell, 2009). The pragmatic paradigm was utilised as the philosophical orientation of this study to address the research objectives which required the collection of quantitative and qualitative data.

1.8.2 Research Approach

Based on the philosophical orientation, this study employs the mixed methods approach. Mixed methods approach includes the mixing of quantitative and qualitative methods in research studies to understand a research problem (Onwuegbuzie and Leech, 2004; Creswell and Tashakkori, 2007). The integration of both quantitative and qualitative approach in a research assists in gaining a deeper understanding of the phenomena under study (Johnson et al., 2007). Furthermore, this approach allows tractability in addressing the research questions the study

seeks to answer. Employing both approaches enables the validation of quantitative results by referring to information extracted from the qualitative phase of the study and vice-versa.

1.8.3 Research Design

This study seeks to describe the relationship between the elements of KM capability (knowledge infrastructure and knowledge process) on nursing care performance. Therefore, the study employed a survey research design. Survey design is in alignment with pragmatic paradigm, which is diverse and allows the application of mixed methods (Creswell, 2009). Survey design has been used in similar studies on nursing care (Padilha et al., 2007; Merkouris et al., 2004).

1.8.4 Sampling Procedures

Stratified sampling and purposive sampling procedures were employed in the selection of respondents. Proportionate stratified sampling was used for quantitative data collection (questionnaires). The goal of proportionate stratification in this study is to ensure that sample sizes for strata are of their expected size and the sample chosen representative of the population.

The population of registered nurses in University College Hospital (UCH) and Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) was stratified according to the clinical units. Proportionate allocation was used to select the size of the sample from each stratum. Purposive sampling techniques are primarily used in qualitative studies and may be defined as selecting units such as individuals or groups, based on specific purposes associated with answering research questions (Teddlie and Yu, 2007). Therefore, purposive sampling was employed in selecting the deputy directors of nursing services (DDNS) for the collection of qualitative data because of their experience and understanding of the subject matter.

1.8.5 Data collection Method

Survey questionnaire was used to solicit the quantitative data from the registered nurses covering themes of knowledge management infrastructure (IT support, organisational structure, organisational culture) and knowledge management processes (acquisition, conversion, application, and protection). In addition, data was gathered on nursing care performance covering patient safety, effectiveness, timeliness, and efficiency. Qualitative data was gathered through the application of semi-structured interview from the Deputy Director

Nursing Services (DDNS) covering themes of infrastructural policies, knowledge management process, and challenges faced in providing efficient nursing care in Obafemi Awolowo University Teaching Hospital (OAUTHC) and University College Hospital (UCH) respectively.

1.8.6 Validity and Reliability

Survey questions were adapted from similar studies to ensure reliability and validity of instruments. A pilot study was conducted to validate the survey questionnaire and interview guide in a teaching hospital that was not involved in the actual survey. The instrument was also subjected to construct and content validity. This was done using judgmental validation i.e. checking of constructs by an expert in the field. Furthermore, Cronbach's Alpha and item to total correlation were examined to validate the reliability and internal validity of the questions.

1.8.7 Data analysis and Presentation

Analysis of Moment Structures (AMOS) version 22 using Statistical Package for Social Sciences (SPSS) was employed for the analysis of the quantitative data using descriptive statistics such as percentages and frequency for the demographic data and statistical techniques such as structural equation modelling (SEM) to answer the research questions and hypotheses. In contrast, qualitative data was subjected to thematic content analysis.

1.8.8 Ethical consideration

The researcher designed an informed consent form for the respondents and ensured that all respondents involved in the study willingly consented to participate in the research and assured confidentiality of their responses. Ethical clearance was obtained from the Ethical and Research Committee of both health institutions -Obafemi Awolowo University Teaching Hospital (OAUTHC) and University College Hospital (UCH) (see Appendices 3-17), where the research was executed. The study also conformed to the University of Kwa-Zulu Natal's ethics policy (see Appendix 18).

1.9 Significance of the study

This study is significant on the following grounds: firstly, the findings of this study would contribute to policy by serving as a basis for developing KM strategy; secondly, the findings

will shed light on the KM practices for possible consideration by health institutions in Nigeria to implement KM thereby ensuring effective and efficient nursing care delivery to the patients. The research will create awareness of the support needed by nursing personnel in the health institutions in Nigeria to make a productive application of knowledge-based resources to enhance nursing care; thirdly, this study will contribute to the domain of literature in the field of knowledge management in nursing care performance.

By drawing from the existing theories and concepts of KM, this study complements and contributes to the KM research and theory from the context of Nigeria. The study is expected to reveal knowledge management infrastructure gaps for delivering efficient patient care in Nigeria. Due to paucity of research on KM in the field of nursing care in Nigeria, the results from this study will serve as a foundation for future research.

1.10 Delimitations of the Study

The delimitations of this study were:

- i) The study investigated KM infrastructure and processes specifically in nursing care. The researcher focused on registered nurses and excluded other health professionals such as medical doctors, nursing assistants, staff nurse, pharmacists, radiologists etc. The decision to delimit the research to registered nurses was motivated by the fact that nurses are the backbone of the healthcare system as they serve as the key contacts for patients in all healthcare settings.
- ii) This study focused only on selected teaching hospitals in the South-west region of Nigeria and did not cover other types of hospitals.
- iii) Due to the scarcity of literature on KM capabilities in nursing in Nigeria which limited the study, the researcher relied on literature in developed countries and some developing countries.

Furthermore, during data collection, the following challenges were conspicuous:

1. The busy schedule of the registered nurses made it difficult for the researcher to recover some of the survey instruments distributed to them.
2. There was difficulty in carrying out face-to-face interviews with some of the deputy directors of nursing services due to their busy schedule.

3. Some questions were left unanswered by the respondents due to reasons best known to them.

The challenges posed by the difficulty in retrieving the survey instruments were addressed by employing the help of research assistants in retrieving the questionnaires. In addition, regarding the deputy directors who could not make the appointment for the face-to face interviews, the researcher conducted some interviews on the phone. The survey respondents who left some questions unanswered were educated about the importance of answering the questions. However, these limitations did not affect the validity and reliability of the results which were initially validated by pre-testing the survey instruments through a pilot test before commencement of the main survey. The main survey yielded a high response rate which was considered excellent.

1.11 Definition of key terms

This section provides the operational definitions of important terms used in context of this study.

Acquisition process: “Knowledge management processes oriented towards obtaining knowledge” (Gold, Malhotra and Segars, 2001:190).

Application process: “Knowledge management processes oriented toward the application, exploitation and actual use of the knowledge” (Gold, Malhotra and Segars, 2001:191).

Conversion process: “Knowledge management processes oriented toward making existing knowledge useful” (Gold, Malhotra and Segars, 2001:192).

Knowledge: Knowledge refers to the “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 from and is applied in the mind of knowers. In organisations, it often becomes embedded not only in the documents and repositories but also in organisational processes, practices, and norms” (Davenport and Prusak, 2000:3).

Knowledge management: Knowledge management refers to “an organisational capability that allows people in organisations, working as individuals, or in teams, projects, or other such communities of interest, to create, capture, share, and leverage their collective knowledge to improve performance” (Lakshman, 2007:55).

Knowledge management capabilities: “An organisation’s capacity or routine to recognize, create, transform, and distribute knowledge. It may be divided into two aspects of knowledge infrastructure capability and knowledge process capability” (Gold, Malhotra and Segars, 2001:187).

Knowledge Infrastructure Capability: are “organisational activities or mechanisms that can stimulate knowledge creation, protect knowledge, and facilitate the sharing of knowledge in an organisation” (Lee and Choi, 2003:181).

Knowledge Process Capability: are “processes that represent the basic operations of knowledge which are grouped into four broad dimensions of process capability—acquiring knowledge, converting it into useful form, applying or using it, and protecting it” (Gold, Malhotra and Segars, 2001:190).

Nursing care performance: Nursing care performance in this study is the effectiveness of knowledge management practices among nursing professionals which is defined by the capacity demonstrated by the organisation to acquire nursing resources and use them in a sustainable manner (Dubois et al., 2013).

Organisational structure: Organisational structure is “rules, policies, procedures, and processes, hierarchy of reporting relationships, incentive systems, and departmental boundaries that organize tasks within the firm” (Gold, Malhotra and Segars, 2001:188).

Organisational culture: Organisational culture is the “shared values, beliefs, and practices of the people in the organisation” (McDermott and O’Dell, 2001:78).

Protection process: “Knowledge management processes are designed to protect knowledge within an organisation from illegal or inappropriate use or theft” (Gold, Malhotra and Segars, 2001:190).

Technological Infrastructure: The technological infrastructure refers to the “technology-enabled information, knowledge, and communication systems that exist in a firm and allows the flows of knowledge to be integrated” (Gold, Malhotra and Segars, 2001:187).

1.12 Structure of Thesis

The thesis comprises of seven chapters. The content of the seven chapters is discussed below.

Chapter One: Introduction

Chapter one covers the context of the study, background to the study, description of the study area, research objectives, research questions and research hypotheses. In addition, theoretical framework, preliminary literature review, summary of research methodology, significance of the study, delimitations of the study, definitions of operational terms and the thesis structure are presented respectively.

Chapter Two: Theoretical Framework

Chapter two provides the theoretical underpinnings of the study and develops the conceptual framework focusing on variables under investigation such as conceptualisation of KM capability components, relationships between KM capability components and nursing care performance.

Chapter Three: Literature Review

Chapter three discusses the motive of the literature review and offers a body of evidence to identify and appraise current literature and research findings. It provides a review of related existing literature covering knowledge management, knowledge management in Nigeria, knowledge management capabilities, perspective of knowledge management in nursing care and leveraging knowledge management to support nursing care. The review among other observations notes the paucity of knowledge management discourse in nursing care and draws attention to the call for intense research into knowledge management practices within nursing in healthcare systems. The gaps in literature as well as how this study addresses them are outlined.

Chapter Four: Research Methodology

Chapter four focuses on the research methodology explaining the overarching philosophical orientation and theoretical framework which guide the research. The chapter discusses the research process and methods. The chapter further explains the design of the data collection

instruments, measurement of the constructs, the research population, sampling procedure, sample size, and selection. The evaluation of validity and reliability of the data collection instruments, the pilot study, the approach to data analysis, and ethical considerations associated with this research are addressed.

Chapter Five: Data Analysis and Presentation of Results

Chapter five provides the results of data gathered using a mixed methods design. As highlighted by Creswell et al. (2003) the quantitative phase was undertaken concurrently with the qualitative phase, where the quantitative data and analysis provide a general understanding of the research problem which can then be refined by exploring participants' views in depth within the qualitative phase. Chapter five presents the results of data analysis and discussion of results using the theory as the framework.

Chapter Six: Discussion of Findings

Chapter six discusses the results from the data gathered from questionnaires and semi-structured interviews. Results are integrated from the quantitative and qualitative phases of the research. The chapter interprets the results using extant empirical and theoretical literature as well as the main research questions.

Chapter Seven: Summary, Conclusion, and Recommendations

Chapter seven presents a summary of the findings and conclusion through the comparison of the actual research outcomes with the objectives and research questions set out at the beginning of the research. This chapter also provides the originality of the study, contribution to the study, recommendations, and suggestions for further research.

1.13 Chapter Summary

This chapter laid the foundation for the thesis. It introduced the background to the field of study, the research problem, and objectives of the study, research questions, research hypotheses, and potential contributions. It also included an explanation of the methodology, an outline of the thesis, the delimitations of the study and definition of key terms used in the study. The following chapters describe the research in detail.

CHAPTER TWO

THEORETICAL FRAMEWORK

2.1 Introduction

This chapter discusses the theoretical framework underpinning the study. The theoretical framework acts as a guide that gives the direction of the research process (Bawden, 2008). The theoretical framework therefore informs every decision made in the research process. The study aimed at examining the influence of the capabilities of knowledge management on the performance of nursing care and challenges involved in selected teaching hospitals in the South-west region of Nigeria. Conducted against the backdrop of knowledge management in nursing care, the study addressed the following research questions:

1. What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge in KM capability affect nursing care performance?
4. How can KM capability be leveraged to support nursing care performance?

Pettigrew and McKechnie in Ocholla and Le Roux (2011) asserted that before a working definition can be given to a theoretical framework, there is need to define what a theory is. Bacharach (1989:496) defined a theory as “a statement of relations among concepts within a set of boundaries, assumptions, and constraints”. According to Creswell (2009:51), a theory is “an interrelated set of constructs (variables) formed into proposition. Theory connects the researcher to knowledge with a pointer to relevant research methods”.

Eisenhart (1991:205) described a theoretical framework as “a structure that guides research by relying on a formal theory constructed by using an established, coherent explanation of certain phenomena and relationships”. Grant and Osanloo (2014) highlighted that the theoretical framework is the basis for the construction of knowledge in a research. The importance of a theoretical framework in scholarly research was restated by Bell (2005) who emphasised that, theoretical framework impacts how researchers design a study and how they collect and analyse

the data. Bell (2005) further argued that the theoretical framework provides a grounding base or an anchor for the literature review and most importantly, the methods and analysis. In this study, organisational capability theory was adopted in line with the pragmatic research paradigm.

The list of knowledge management models in literature is by no means exhaustive and only those considered relevant to the study are discussed in this chapter. The knowledge management models discussed includes organisational capability theory, social capital theory, resource-based and knowledge-based view of the firm. This study was underpinned by organisational capability theory developed by Gold, Malhotra and Segars (2001) which set the foundation of the research plan. Organisational capability theory was developed to assess crucial organisational capabilities that directly influence an organisation's drive toward effective knowledge management as measured by organisational effectiveness.

Organisational capability theory is chosen for this study; as indicated by Anderson (2009), it is rooted in social capital theory, resource-based view of the firm (RBV) and knowledge-based view of the firm (KBV). Moreover, it is proved to provide robust explanation in studying KM capability in various sectors of healthcare settings. The discussion of the theoretical models is discussed in relationship to their variables investigated in this study. Further examination of the theoretical models is undertaken to uncover their strengths and weaknesses.

This Chapter is organised into different sections based on the guidelines concerning how the theoretical framework chapter should be presented (Creswell, 2009). The following thematic areas are presented as follows: Section 2.2 - Organisational Capability Theory; Section 2.3 - the Social Capital Theory; Section 2.4 - the Resource-Based View Theory; Section 2.5 - the Knowledge-Based View Theory. In addition, Section 2.6 presents the theoretical framework of the study, while 2.7 discusses the hypotheses. The last section, 2.8 outlines the summary of the chapter.

2.2 Organisational Capability Theory

According to the organisational capability theory, the knowledge infrastructure capability involves three key dimensions namely: technology, structure and culture; knowledge process dimension of acquisition, conversion, application, and protection. The dimensions allow the intensification of social capital in an organisation (Gold et al., 2001). The technology

infrastructure refers to the firm's technological resources used by the organisation (Teece, 1998; Leonard and Sensiper, 1998; Leonard, 1995; De Long, 1997; Lee and Choi, 2003, Cho, 2011). The technology infrastructure is suited to mobilise social capital for the creation of knowledge and integration of fragmented flows of information" (Gold, et al., 2001:187). Different researchers highlighted that although technology indirectly affects knowledge management success, it is an indispensable foundation for the improvement of knowledge management capabilities (Iftikhar, 2003; Khalifa and Liu, 2003).

Organisational culture consists of shared contexts (Appleyard, 1996; De Long, 1997; Leonard and Sensiper, 1998; Von Krogh, 1998; Anderson, 2009; Cho, 2011) such as the interactions among employees which are frequently the foundation of the formation of novel ideas (Sánchez et al., 2013) and is essential in the innovation process (Lin, 2007). Organisational structure focuses on the presence of norms and trust mechanisms (Gold et al., 2001; Nonaka, and Takeuchi, 1995; O'Dell and Grayson, 1998; Sanchez and Mahoney, 1996; Anderson, 2009; Cho, 2011) as well as other formal organisational structures which allow and stimulate employees to create, share knowledge and leverage technology infrastructure (Anderson, 2009). Within the knowledge infrastructure, intellectual capital is created through the process of exchange and combination that occurs within the social network of an organisation. Effective coordination of employees' activities within the firm and the combination of their knowledge is an important aspect of improving organisational performance (Lopez, 2005).

Based on previous studies, Gold et al. (2001) categorised KM process into four broad dimensions of acquisition, conversion, application, and protection. Knowledge management processes are basic operations required to leverage the knowledge efficiently throughout the organisation (Nonaka and Takeuchi, 1995; Grant, 1996; Spender, 1996; Khalifa and Liu, 2003; Gold et al., 2001; Yang and Chen, 2007). A firm can harmonise and utilise new knowledge by developing both knowledge infrastructure and knowledge process capabilities for effective performance (Nahapiet and Ghoshal, 1998; Nonaka and Takeuchi, 1995). According to Gold et al. (2001:198):

“The knowledge acquisition process is oriented toward obtaining knowledge from diverse sources both within and outside the organisations and involves acquiring, seeking, generating, creating, capturing, and collaborating activities, all towards the accumulation of knowledge. The knowledge conversion process is on the other

hand concerned with organizing and making existing knowledge valuable. The knowledge application process is focused on the actual use of the knowledge while the knowledge protection processes are required to protect the organisational knowledge from illegal or inappropriate use or theft”.

Gold et al. (2001) submitted the collective effectiveness of knowledge management infrastructure and knowledge management process results in the overall effectiveness of the organisation. Therefore, Gold et al. (2001)’s organisational capability theory provides one of the very few frameworks that attempt to investigate the role of knowledge capabilities in an integrative framework. In their *framework* they distinguish between KM infrastructures, including structural, cultural, and technical infrastructures and KM.

However, the limitation of organisational capability theory by Gold, Malhotra and Segars (2001) is that it overlooks the interrelationships among different capabilities of KM infrastructure and their relationships with KM process capabilities (Khalifa, and Shen, 2010). The relationships among the constructs of knowledge infrastructure capability, knowledge process capability, and nursing care performance were empirically investigated in this study. The organisational capability model is shown in Figure 2.1.

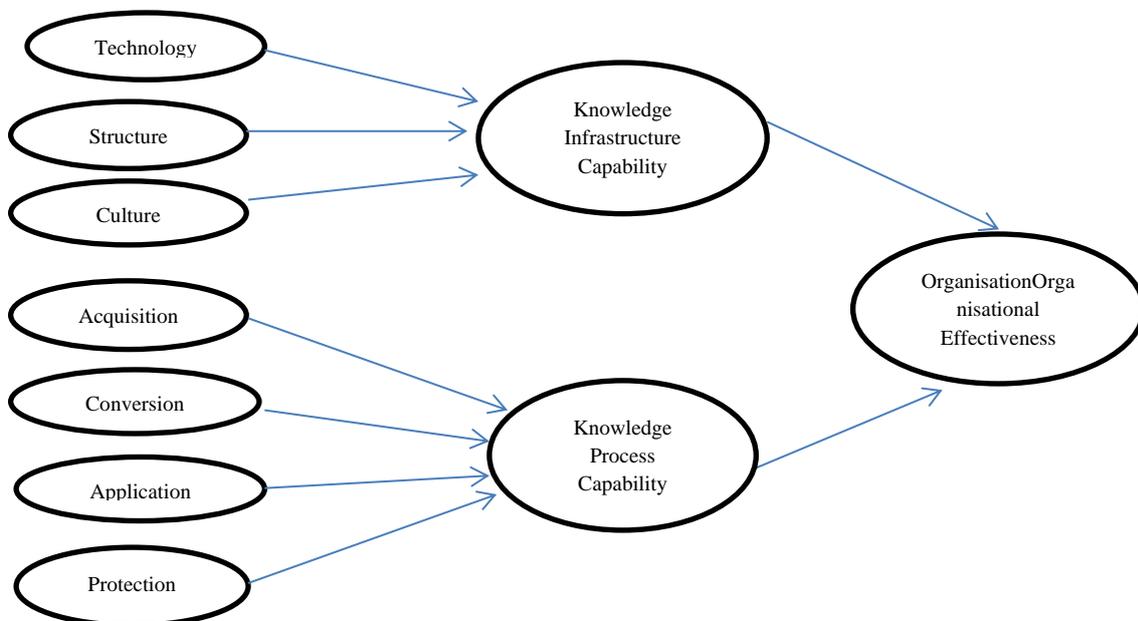


Figure 2.1: Organisational Capability Model (Gold, Malhotra and Segars, 2001)

The organisational capability theory was found to be more comprehensive and appropriate for the study. Given the nature of the research problem, the reason for choosing organisational capability theory is that it allows for the clarification of the KM capabilities on which nursing competencies are based. Besides, the theory has been previously applied in nursing care research such as that of Ghosh and Scott (2005) who investigated effective knowledge management for hospital nurses. Ghosh and Scott (2005) verified that the organisational capability model developed by Gold et al. (2001) shows the relationships between the three organisational enablers (infrastructure) - technology, organisational structure, organisational culture, knowledge process capabilities, and their influences on KM effectiveness in a clinical nursing setting.

Gold et al.'s (2001) theory was also used to underpin a PhD study entitled organisational capabilities as predictors of effective knowledge management by Anderson (2009). The study provided an empirical validation of the Gold et al. (2001) theory. Bharadwaj, Chavhan and Raman (2015) also validated organisational capability theory in their study of KM capabilities in 156 organisations and their impact on knowledge effectiveness in India. The study established that both infrastructure and process capabilities play an important role in improving KM effectiveness.

2.3 Social Capital Theory

According to Field (2003:2), the central idea of social capital theory is that “social networks are valuable assets. A sequence of networks is formed through the connection of people that tend to share common values. Membership of networks and a set of shared values are at the heart of the concept of social capital”.

Central concepts of the social capital theory can be traced back to three seminal figures: Pierre Bourdieu (1986) with regard to social theory; James Coleman (1992) in his discussions of the social context of education; and Robert Putnam (1993; 2000) in his discussion of social capital in “*Making Democracy Work*” and arguments in “*Bowling Alone*”. However, the concept of social capital came into prominence for research and policy discussion through Robert D. Putnam (1993; 2000).

Bourdieu (1986:246) defined “social capital as the sum of resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less

institutionalized relationships of mutual acquaintance and recognition”. Coleman (1992:98) underscores “social capital by its function. It is not a single entity but a variety of different entities having two characteristics in common. They all consist of some aspect of social structure, and they facilitate certain action of individuals who are within the structure”. According to Putnam (1993:167) “social capital refers to features of social organisation such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions”. In agreement with these definitions, Lin (2001:24-25) conceded, “Social capital may be defined operationally as resources embedded in social networks (or ties) and accessed and used by its members for actions. Thus, the concept has two important components. Firstly, it represents resources embedded in social relations rather than individuals. Secondly, the access and use of such resources reside with the members”.

Social capital is described by Nahapiet and Ghoshal (1998) in terms of structural, relational, and cognitive dimensions. Nahapiet and Ghoshal (1998) highlighted these dimensions as interrelated and defines the structural dimension as the impersonal configuration of linkages between people or units, referring to the degree of closure or interconnectedness among members of the network. The structural dimensions also represent configurations and patterns of connections between people (Zheng et al., 2010). The relational dimension encompasses the idiosyncratic relationships individuals have established with each other through a series of communication such as trust, obligations, and expectation. This concept captures the quality of the relationships that increases the chance of innovation-inducing interactions (Zheng et al., 2010).

The cognitive dimension refers to those resources involved in sense making and interpretations among people and serves to reconstruct meaningful representations of the knowledge so that it retains the necessary content to remain useful and provide meaningful communication that enables the exchange and combination of knowledge between and within the subjects (Cicourel, 1992). It is embodied in attributes such as shared representations, behavioural and linguistic codes, systems of meaning, paradigms, understandings and interpretations, as well as shared vision and/or a set of common values that facilitate communication in a group and collective knowledge creation (Nahapiet and Ghoshal, 1998). The three dimensions of social capital activate knowledge sharing and transfer that improves the creation of intellectual capital.

Social capital enables the growth of intellectual capital by impacting the conditions essential for the exchange and combination of knowledge to take place within the social network of an organisation (Nahapiet and Ghoshal, 1998). Fukuyama (1995) explained that social capital can improve the KM process in an organisation because it contributes to the efficiency of the employees, and monitoring mechanisms that are necessary in systems among organisational members. This can be extended to the metaphor of social capital to organisational units.

Social capital theory posits that infrastructure elements enable maximisation of social capital by providing a medium for the social collaboration of people as the foundation for KM (Gold, Malhotra and Segars, 2001). Social capital consists of various knowledge infrastructures such as organisational structure and culture. Thus, an organisation must have the essential resources and competences to manage knowledge effectively, such as organisational structure, organisational culture, people, and technology (Nguyet, 2010).

Social capital theory has been criticised by some researchers and practitioners for its use in research, structure and connection with other academic concepts because of its lack of a commonly agreed operationalisation (Sobel, 2002; Lyons, 2001; Burt, 2000). Nahapiet and Ghoshal (1998) noted the lack of consensus over the precise definition of social capital as being a challenge for research using social capital. Other limitations of social capital theory include the methodological limitations and other empirical indications related to the type and quantity of social capital (Haynes, 2009). The various definitions identified in the literature originate from the highly precise nature of social capital and the complication of its conceptualisation and operationalisation (Adler and Kwon, 2002). According to Maraffi (1994), social capital and its effects cannot be accurately measured, despite some influential research utilising oversimplified measures and misleading comparisons (Maraffi, 1994).

Despite these criticisms, the concept of social capital has been getting increasing attention by scholars from several different areas of disciplines in the social sciences. Empirical studies about social capital have found that the three different dimensions of social capital provide the essential infrastructure for knowledge management. Notable contributions include those on knowledge creation (Zhao, Ha and Widdows, 2016; Yli-Renko, Autio, and Sapienza, 2001); knowledge contribution (Wasko and Faraj, 2005; Chang et al., 2012); and knowledge sharing (Hoffman et al, 2005; Widén, 2011; Aslam et al., 2013).

The Social Capital Theory is presented in the figure 2.2 below:

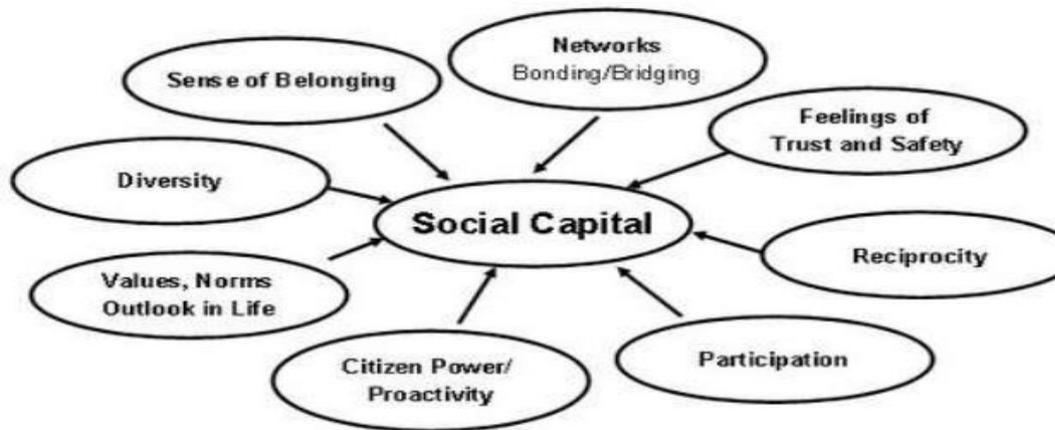


Figure 2.2: The Social Capital Theory (Source: Chen, 2013)

One of the primary focus of this study is on the relationship between knowledge infrastructure and knowledge management processes. This relationship can be explained based on social capital theory. The theory offers methodical mechanisms for how knowledge enablers can improve knowledge management processes. Social capital theory has been used in related studies by Nguyen (2010) in a PhD study at Southern Cross University entitled “Knowledge management capability and competitive advantage: an empirical study of Vietnamese enterprises”. The results imply that knowledge capabilities are combined, related, and networked resources. Moreover, the study found that individual KM capabilities should not be examined separately but rather should be integrated to determine the capabilities of KM in an organisation. In addition, the study reported that intellectual capital is created through the socialisation and combination of knowledge. The findings of the study also revealed that more than 80% of the differences in KM process capability across the studied firms can be clarified by the impact of social infrastructure of organisational culture, organisational structure, and human resources with organisational culture having the most influence. This suggests that the efficient management of knowledge is connected to the efficient translation of cultural values and norms in the organisation.

2.4 Resource-based View Theory

The resource-based view (RBV) is a generally recognised theory in the field of strategic management and emphasises the firm’s resources as fundamental determinants of competitive advantage and performance (Powell, 2001). The RBV is a multi-faceted theory that is

increasingly being applied in knowledge management research to conceptualise how knowledge resources can be harnessed for improving organisational performance. In a knowledge society, the performances of organisations depend on their agility in a competitive environment through continuous creation and application of new knowledge (Priem and Butler, 2001).

A central premise of the resource-based view is that firms compete based on their resources and capabilities (Peteraf and Bergen, 2003) such as its managerial skills, administrative processes and procedures information, as well as its controls that allows the firm to strategize and execute procedures that enhance its productivity and value (Wernerfelt, 1984; Barney, 1991; Barney, Wright and Ketchen, 2001; Grant, 1996; Peteraf and Bergen, 2003). According to Grant (1996), RBV resources includes physical capital resources (e.g firm's equipment), human capital resources (such as experience, judgement and intelligence of individuals) and organisational capital resources (such as firm's structure, planning, control and coordinating systems) that allow the firm to create and execute tactical approaches that improve its productivity and value.

The RBV of the firm focuses specially on the inside of the firm, its resources and capabilities which are the fundamental determinants of performance (Wernerfelt, 1984; Barney, 1991; Grant, 1991; Peteraf, 1993; Makhija, 2003; Bridoux, 2004); and stresses the performance implication of strategic resources that are available to the firm (Amit and Schoemaker 1993; Hunt and Morgan 1995; Peteraf, 1993). The firm is envisaged as a collective entity in which individuals collaborate to generate, transfer, and apply knowledge (Kogut and Zander, 1996). RBV provides a clear framework for categorising antecedents of KM capabilities and recognises how a firm's resources interact to achieve long-term performance (Teece, 1998).

Barney (1991) highlighted that the RBV of the firm operates on two assumptions. First, it assumes that firms within an industry are heterogeneous with respect to the strategic resources they control. Second, it assumes that resource heterogeneity persists over time, since resources required to implement a firms' strategies are not perfectly mobile over time. Therefore, resource uniqueness or heterogeneity is considered a necessary condition for the resources to contribute to superior long-term performance.

In addition, Barney (1991) noted that a firm's resources must meet four criteria to provide sustainable performance and competitive advantage: they must be valuable, rare, perfectly inimitable, and non-substitutable (VRIN). Priem and Butler (2001a) revealed that the value of a certain resource is verified in relation to conditions such as the competitors' environment and strategies of the organisation. Resources also need to be rare to improve performance (Barney, 1991). A firm's competitive advantage can be sustained by a valuable and rare resource to the degree that it becomes hard to imitate (Barney, 1991). Inimitability refers to the extent to which resources are difficult to replicate by other firms; non-substitutability of resources infers that a resource cannot be substituted by another one (Dierickx and Cool, 1989).

Many studies on RBV and organisation performance had been done previously (Henderson and Cockburn, 1994; Conner, 1991; LaFave, 2008; Godfrey and Hill, 1995; Villalonga, 2004; Hansen and Wernerfelt, 1989; Henderson and Cockburn, 1994; Kor and Mahoney, 2000; Deeds et al., 1998; Mahoney and Pandian, 1992). Most studies reported a positive association between a firm's capabilities and its performance. A PhD study by Geok (2010) at National University of Singapore entitled "Knowledge Management Capability: A resource-based view and comparison of public and private organisations", guided by the resource-based theory, gathered data from public and private organisations to investigate the relation of organisation resources and KM capability. Findings indicated that the availability of KM technology support and non-IT KM investments significantly affected the level of KM capability. KM technical support and non-IT KM investments had a stronger effect on KM capability when enhanced by organisational senior management championship.

Chuang (2004) examined "the relationship between KM capabilities and competitive advantage" using RBV as a theoretical framework. KM resources was categorised as social KM resources, and technical KM resources. Data was collected from 177 firms using surveys which were analysed and tested. The results confirmed the impact of social KM resource on competitive advantage. Technical KM resource is negatively related with competitive advantage, and KM capability is significantly related with competitive advantage. Smith (2008) in a study investigated "the measures of reputation among health service-sector businesses" using resource-based view of the firm as the theoretical underpinning. The study established that for an intangible asset (reputation) to be considered strategic it must meet the VRIN criteria.

The Resource-based view model is presented in Figure 2.3 below.

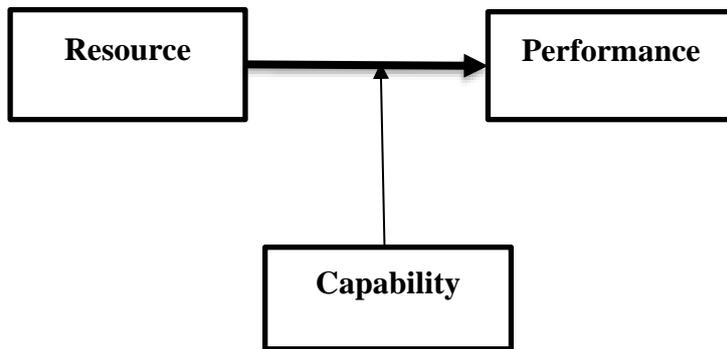


Figure 2.3: Resource-Based View of the Firm (Source: Park and Lee, 2011)

The down side of the RBV is that the precise descriptions of main concepts such as resources, competences, capabilities, and assets have been controversial among researchers and practitioners interested in the RBV (Tsang, 2000). This explosion of different descriptions, meanings and classifications has been challenging in research using RBV, as it is often unclear what researchers mean by the concept (Priem and Butler, 2001). The RBV has been criticised for being conceptually unclear and redundant and with limited attention to the mechanisms by which resources are converted to long term performance and competitive advantage (Eisenhardt and Martin, 2000; Priem and Butler, 2001b). Although the RBV recognises the crucial role of knowledge in firms for achieving an improved performance, knowledge is treated as a generic resource, rather than having superior features. Therefore, it does not differentiate between various types of knowledge-based capabilities (Alavi and Leidner, 2001). The RBV proposes that knowledge as organisational competencies is established in the organisational resources complemented by employee skills and technologies but failed to show how to exploit the values of the resources (Ambrosini and Bowman, 2001).

The RBV does not accurately stipulate the differences between resources and capabilities. It is unclear (a) whether they are intrinsically internal to the firm or can be outsourced, and (b) whether resources by themselves enable capabilities or capabilities create resources (Kaplan et al., 2001). Abbas (2015) pointed out that RBV focuses specifically on organisation-specific resources and knowledge as the critical resource for organisation success, thereby disregarding the input of resources beyond organisation and other knowledge management infrastructure

such as technology, culture, databases/repositories as an indispensable part and resources for competitiveness.

These limitations highlighted have made the resource-based view not wholly applicable for this study, however, its constructs such as physical capital resource (i.e. IT equipment), organisational capital resource (i.e. culture, structure), and human capital resource (i.e. knowledge process) can be used to address research question 1 of the present study.

2.5 Knowledge-based View Theory

The knowledge-based view of the firm which is an extension of resource-based view of the firm (RBV) initially promoted by Penrose (1959) considers knowledge as the most strategically significant resource of the firm and later expanded by others (Grant, 1996; Spender, 1996; Barney, 1991; Kogut and Zander, 1992). According to Grant (1997:451) the theory explains “the rationale for the firm, the delineation of its boundaries, the nature of organisational capabilities, the distribution of decision-making authority and the determinants of strategic alliances”. However, Spender (1996) made the following critical assumptions about knowledge-based view of the firm: (1) the firm can be understood as a system of knowledge; (2) explicit and implicit knowing are clearly dissociated; (3) firms are conceived as cognising entities (i.e. having a collective consciousness); and (4) intuition, shaped by shared cultural practices, is a superior source of managerial knowledge.

Although the resource-based view of the firm examines the significant role of knowledge in firms in accomplishing a competitive advantage, supporters of the knowledge-based view argue that the resource-based perspective has its limitations. The distinct treatment of knowledge and resources distinguishes the KBV from the RBV which perceives resources in a broad view tending to include many concepts traditionally associated with knowledge (Barney, 1996). Other pioneers of the knowledge-based view include Connor and Prahalad (1996), von Krogh and Roos (1995), Nonaka (1994) and Hedlund (1994).

The concept of knowledge-based view of the firm came into prominence for research and discussion through Grant (1996) and Spender (1996) in a special issue of *Strategic Management Journal* (1996), titled “Knowledge and the Firm” in 1996. Here, they introduced two different conceptual directions: an economic and a social-constructionist view (Grant, 1996; Grant and Spender, 1996; 1996b). Grant’s interest came from industrial economics,

inspired by positivist philosophy, which led him to work on an extension of the resource-based approach of the firm. Spender called for a radical change “towards a social constructionist position which focuses on the dynamics of the individual’s institutional context” (Spender, 1996b:53). Knowledge should be regarded as embedded within socio-cultural conventions and conceptualisations; thus, as socio-culturally construed (Mir and Watson, 2000).

Foss (2005:84) summarised the “essential elements of the KBV as follows:

- 1- Knowledge is the most important resource and factor of production.
- 2- Performance differences between firms exist because of differences in firms’ stock of knowledge and capabilities in using and developing knowledge.
- 3- Organisations exist to create, transfer, and transform knowledge into competitive advantage.
- 4- Knowledge is related to humans.
- 5- Individuals are intentional and intelligent agents.
- 6- Humans are bounded by cognitive limitations; how much and what they can know, have cognitive limits and therefore have to specialise.
- 7- Especially in complex issues which cannot be understood by any single individual, there is a need for integration and coordination of knowledge.
- 8- Cognition and action are related: knowledge is both acquired by and demonstrated in action.
- 9- Knowledge is demonstrated in many forms and located on many levels: it is situated in the minds and bodies of individuals, embedded in organisational routines and processes, as well as codified in databases and books.
- 10- Some knowledge can be externalised into explicit form, while some knowledge will always remain tacit.
- 11- The form of knowledge influences how it can be leveraged and transferred.
- 12- Shared tacit knowledge, demonstrated for example in capabilities, is the most important type of knowledge from the value creation point of view.
- 13- Knowledge cannot be fully managed in the same sense as other types of resources; its management more resembles the creation of suitable contexts and cultivation.
- 14- Knowledge is dynamic: it is continuously re-interpreted, modified, and related to learning and change”.

Grant (1996:110) noted that “the success of the KBV can be attributed to the fact that it extends beyond the traditional concerns of strategic management to address other fundamental concerns of the theory of the firm, notably the nature of coordination, organisational structure, the role of management and the allocation of decision-making rights, determinants of firm boundaries, and the theory of innovation”. The KBV supporters contend that because knowledge-based resources are usually hard to imitate and socially multifaceted; heterogeneous knowledge bases and capabilities among firms are the major determinants of sustained competitive advantage and superior performance (De Carolis, 2002, Kogut and Zander, 1996; Grant and Baden-Fuller, 1995; Lopez, 2005).

Knowledge is considered the most important strategic resource since superior knowledge owned by organisations can be used to create innovative ideas and new ways of providing superior value of goods and services to customers (Sharkie, 2003; Teece et al., 1997). Knowledge is embedded and carried through multiple entities including organisational culture and identity, policies, routines, documents, systems, and employees. As a result, the capacity to create, convert, apply and share knowledge can lead to the creation of sustained superior performance (Grant, 1996; Kogut and Zander, 1992; Macher and Boerner, 2006; Matusik and Hill, 1998) because it has value, is a unique creation, and therefore is difficult to imitate (Tsai and Li, 2007; Zack, 1999). Hitt et al., (2001) highlighted that resources like knowledge, learning capacity, culture, team work and human capital are the ones contributing the more to the high performing firms. The Knowledge-based View of the Firm is shown in Figure 2.4:

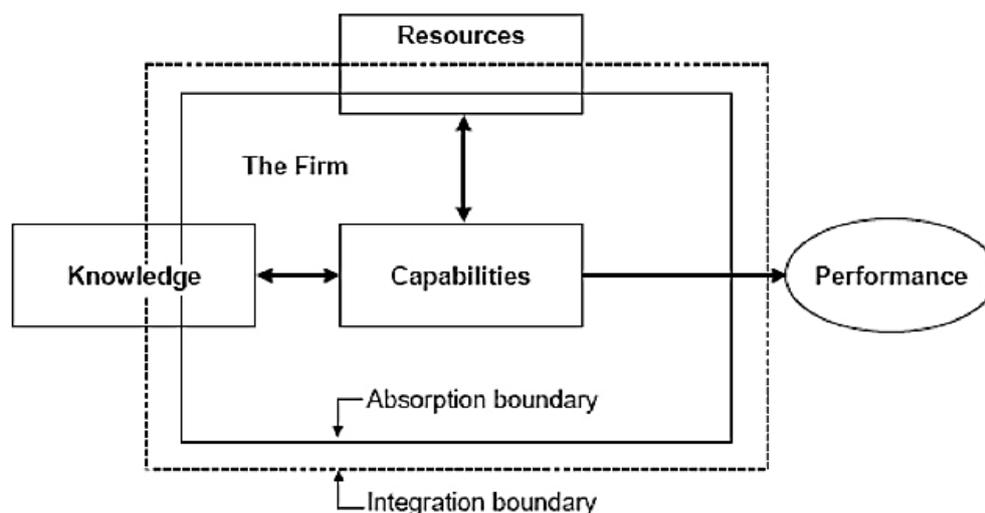


Figure 2.4: Knowledge –Based View of the Firm (Source: Kaplan et al., 2001)

The main criticism is that the KBV does not explain the nature of heterogeneous asset bases that are appropriate to different institutions considering their goals (Bagorogoza, 2015). However, Holtshouse (1998) highlights that the KBV has vague and organic characteristics which is not easily measurable. Knowledge assets need to be more observable for manageability. The meaning of separate reasoning and reflective processing for individuals is underrated by the KBV theory (Ringberg and Reihlen, 2008).

Knowledge-based view emphasises that knowledge resources are especially important for the organisation (Grant, 1996) which gives credence to its relevancy and applicability to research question 2 and 3 of the present study, which seeks to identify the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria. Knowledge-based view has been applied in related studies such as that of Nguyen (2010) titled “knowledge management capability and competitive advantage: an empirical study of Vietnamese enterprises”. The study aimed at providing a model of KM capability and investigated if the model is applicable in the context of less developed countries. The study established that the KM capability model is valid and reliable in less developed countries. The study also supported the knowledge-based view of the firm suggesting that the key basis of competition in organisations is rooted in the capacity to integrate resources and not in capacity to create new knowledge. The findings in the study also suggested that the four elements of KM process capability-acquisition, conversion, application, and protection are integrated; the application process should be utilised to exploit the various types and sources of knowledge to accomplish organisational objectives. Similarly, Alhawari and Al-Jarrah (2012) used KBV in the study of KM processes on the improvement of strategic competence of insurance companies in Jordan.

2.6 Theoretical Framework underpinning this Study

Following the discussion of pertinent and contemporary literature (Hoffman et al, 2005; Wasko and Faraj, 2005; Nguyet, 2010; Geok, 2010; Widén, 2011; Chang et al., 2012; Aslam et al., 2013; Zhao, Ha and Widdows, 2016) relating to the knowledge management infrastructure in the previous sections, the theoretical framework is explored. The researcher applied Gold et al. (2001) organisational capability theory to investigate knowledge management capability in nursing care performance in the selected teaching hospitals. The theory was selected because it provided the most comprehensive clarification and context for knowledge management

capability that would best relate to the unique settings of nursing care in Nigeria. The theory best elucidates knowledge management capabilities by indicating the relationship of information technology, organisational culture and organisational structure as well as the various KM processes. The knowledge management literature reviewed, and the different theories discussed necessitated a tentative framework for this research. Figure 2.5 below shows the proposed research model.

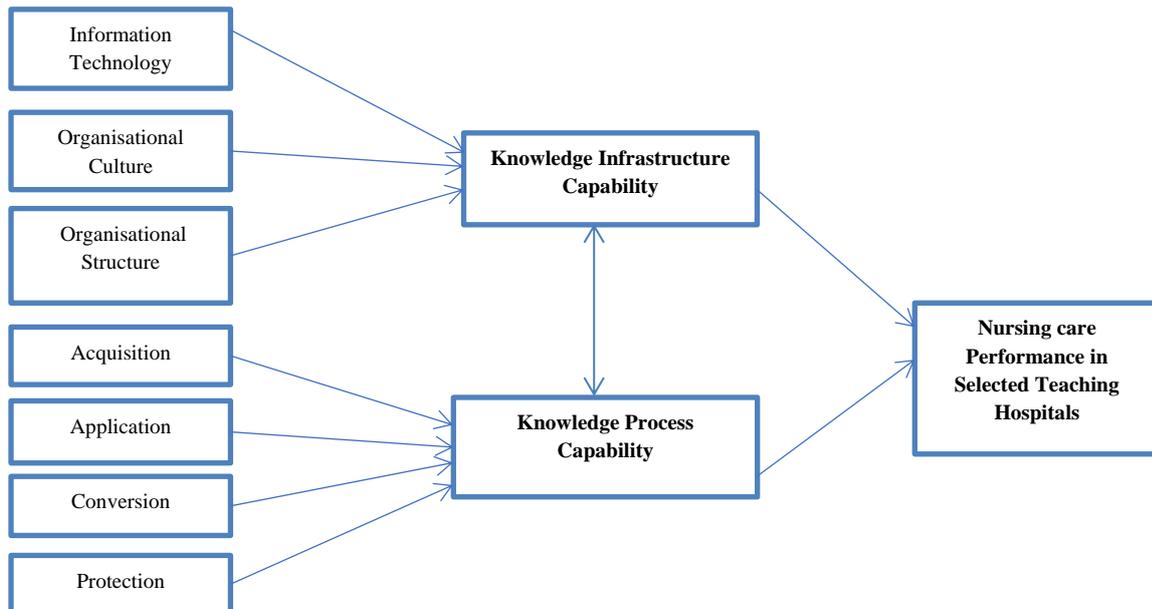


Figure 2.5: Proposed Research Model

This model provides a framework to answer the major research questions and test the hypotheses pertaining to how the factors of KM capability influence the knowledge effectiveness of the registered nurses with regard to organisational culture, the knowledge processes, and the technology.

2.7 Research Hypotheses

The literature on organisational capability theory has stressed that fundamental principle anchoring KM capabilities is their relationship with aspects of organisational performance. As an organisational resource, effective KM through the exploitation of capabilities should contribute to main aspects of organisational performance (Gold et al., 2001). Nurses comprise the largest group of healthcare professionals and play a vital role in healthcare globally; therefore, the performance of nurses is closely linked to the productivity and quality of care provided by the organisations (Awases, Bezuidenhout and Roos, 2013).

Accordingly, this research proposes that nursing care performance in healthcare institutions depends on the level of KM capabilities it possesses; further, drawing from the concept of organisational capability theory on the importance of the network of relationship possessed by a social unit and sum of resources embedded within and derived from it. This study posits that the relationship between the factors of KM capability is expected to improve nursing care performance.

2.7.1 Factors of KM Capability influencing Nursing Care Performance

As identified from the literature review, Gold et al. (2001) operationalised KM capabilities as KM infrastructure capabilities and process capabilities. These capabilities have an impact on organisational effectiveness. The KM infrastructure capability consists of three main dimensions of technology, organisational structure, and organisational culture along with knowledge process capability of acquisition, conversion, application, and protection. To exploit KM infrastructure, KM process capabilities must also be available to store, convert, and disseminate knowledge throughout the organisation (Gold et al., 2001). Therefore, the factors of KM capability considered in this study include information technology, organisational culture, organisational structure, and knowledge process capability.

As highlighted by Tanriverdi (2005), technology has been frequently viewed as a key enabler of KM which facilitates various KM activities through providing effective storage, retrieval, and sharing mechanisms. The researcher hypothesised that:

H₀₁: IT support does not have a positive influence on nursing care performance.

KM effectiveness is constrained in an organisation if it has an encompassing KM system but does not have a supportive organisational culture (Alavi, and Leider, 1999). A supportive culture is characterised by the identification of the value and advantage of KM to organisational performance by organisational members (Alavi, and Leider, 1999; Gopal and Gagnon, 1995), their readiness to participate in KM related activities and to apply technological resources. Hence the hypothesis:

H₀₂: Organisational culture does not have a positive influence on nursing care performance.

Organisational structure includes the hierarchical level of organisational members, reporting relationships, and how work roles are coordinated and controlled to achieve organisational objectives (Herath, 2007). Majority of KM researchers are of the view that structural change in an organisation such as transition from hierarchical to flatter network forms, is effectual for knowledge creation and transfer (Matin and Sabagh, 2015). Hence the study hypothesises:

H₀₃: Organisational structure does not have a positive influence on nursing care performance.

2.7.2 Relationship between Knowledge Infrastructure and Knowledge Process in KM Capability

Although there is a dearth of research on the capable value of the relationship of KM infrastructure and KM process capabilities in relation to nursing care, extant literature had emphasised the role of knowledge management infrastructure as organisational mechanisms for fostering knowledge consistently and stimulating knowledge processes (Stonehouse and Pemberton, 1999; Anderson, 2009). Knowledge process can be thought of as structured coordination for managing knowledge efficiently (Gold et al., 2001) while knowledge management infrastructure is necessary to improve the productivity of knowledge process (Sarvary, 1999). The study hypothesised that:

H₀₅: IT is not positively related to knowledge process in KM capability.

H₀₆: Organisational structure is not positively related to knowledge process in KM capability.

H₀₇: Organisational culture is not positively related to knowledge process in KM capability.

2.7.3 Relationship between Knowledge Infrastructure and Knowledge Process on Nursing Care Performance

According to organisational capability theory, the fundamental belief underlying knowledge management capabilities is their relationship with organisational performance (Cohen and Levinthal, 1990; Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995). KM in nursing care performance is an emerging concept and is more complex in terms of measurement. In the healthcare sector, of the few survey studies in KM, there is paucity of research that empirically investigates the relationship between KM capabilities and nursing care performance. Therefore, the relationships between the dimensions of knowledge infrastructure and

knowledge process capabilities were also investigated in order to verify their integral contribution to nursing care outcome.

The perspective of social capital in organisational capability theory reveals that firms acquire and share knowledge through relationship networks possessed by the social unit. As suggested by social capital theory, technology, structure and culture in KM infrastructure form the definitional foundation of the theoretical framework of social capital that positively impacts key indicators in organisational performance. In addition, the dimensions of knowledge process capability of acquisition, conversion, application, and protection form the operational perspective for the framework of knowledge integration which is positively related to organisational effectiveness. Drawing from this notion, the study posits that the relationship between the elements of knowledge infrastructure and knowledge process is expected to improve nursing care performance. Therefore, the study hypothesised that:

Ho₈: The relationship between IT support and knowledge process in KM capability positively influence nursing care performance.

Ho₉: The relationship between culture and knowledge process in KM capability positively influence nursing care performance.

Ho₁₀: The relationship between structure and knowledge process in KM capability positively influence nursing care performance.

2.8 Summary

Chapter two assessed the suitability of some existing knowledge management capability theories that could guide the investigation of knowledge management capability in nursing care performance in teaching hospitals in South-west Nigeria. Four models were discussed above. They included organisational capability theory, social capital theory, resource-based theory, and knowledge-based theory. The chapter focused on discussing these theories with the intention of providing background to the choice of model that underpins this study. All the models discussed complement each other, as they tend to focus on one aspect of knowledge management rather than all.

After careful consideration, organisational capability theory by Gold, Malhotra and Segars (2001) was deemed suitable as the theoretical framework for the study. The organisational capability theory incorporates major aspects that this study seeks to determine, such as the information technology support, organisational structure, organisational culture, and knowledge processes influencing performance of the registered nurses in the selected teaching hospitals in the South-west region of Nigeria. Anderson (2009) and Ghosh and Scott (2005) are some of the researchers who have validated the model. Anderson used the model to confirm that organisational capabilities are predictors of effective knowledge management among employees in multinational companies, while Ghosh and Scott (2005) used it as a basis to discuss the KM processes and strategy in functions of clinical nurses.

The theoretical framework and the research hypotheses which guide the study were presented and discussed. Owing to the realisation that the less developed countries are facing serious constraints which could impede KM practices in nursing care, the present investigation was undertaken with a view to provide empirical evidence in order to demonstrate that teaching hospitals operating in the selected region in Nigeria could still successfully utilise KM capabilities in improving nursing care by adopting the holistic approach to KM. The next chapter will discuss the literature review.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

The review of literature permits a researcher to examine other studies that are related to his own area of enquiry (Leedy and Ormrod, 2005). Hart (1998:13) stated, “The purpose of literature review includes the selection of available documents (both published and unpublished) on the topic of interest, gathering information, ideas, and evidence written from a particular standpoint and the effective evaluation of these documents in relation to proposed theme”. Wilkinson (2000) opines that although the advantage of a literature review is to support one’s argument, it also enables the notions and thoughts that have been presented by others to be summarised. According to Abbas (2015:46), “literature review captures published and unpublished work from secondary sources and draws attention to important variables, as determined in previous studies that are related to the research problem being investigated and significant findings in the area of investigation”. This chapter reviews the documented literature on which the conceptual and theoretical framework of this study is based. Broader issues around the research questions and key variables of Gold et al. (2001) organisational capability theory that underpins the study are also reviewed. The study aimed to address the following research questions:

1. What are the factors of knowledge management capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in knowledge management capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge process in knowledge management capability affect nursing care performance?
4. How can knowledge management capability be leveraged to support nursing care performance?

3.2 Scope of the Literature Review

The nature of the literature review is diachronic and obtained from both print and electronic resources and focuses on the following key themes: knowledge, knowledge management;

knowledge management practices; knowledge management in nursing care; knowledge management capability; knowledge management infrastructure capability; knowledge management process capability; nursing care performance and challenges of knowledge management in nursing care.

Relevant materials were obtained from the library and the search on the internet was limited to English language studies. The relevant literature within each theme highlighted above; several databases were searched that included among others: PUBMED, MEDLINE, EMBASE, EBSCOHOST, Science Direct, Emerald Insight, Springer Link, JSTOR, World Cat, Access Medicine, BioMed Central, Health Sources: Nursing/Academic Edition, Wiley Online Library, SAGE Premier and Internet search engines such as Google, Google Scholar and Yahoo. The literature review also included books and conference proceedings from Obafemi Awolowo University and University of Ibadan medical libraries. The selection of materials was based upon the relevancy to the objectives of the study.

While the purpose of a literature review is to buttress one's argument, it also summarises the propositions and recommendations that others have already put forward. From the literature reviewed, there are very few empirical studies from Nigeria and in particular South-west region that have focused on knowledge management capabilities in nursing care, thus there is little documented literature on this topic. However, examples have been used mostly from the context of developed countries. This choice was dictated because these were the countries the researcher was able to come across with literature on the topic. Gaps in literature are identified and summary of the chapter presented.

3.3 The Concept of Knowledge

Knowledge is a multifaceted concept and has been differentiated from data and information in various discussions directed at articulating a definition of knowledge (Becerra-Fernandez, Gonzalez and Sabherwal, 2004). For effective patient care quality, teaching hospitals must be able to rely on data, information, and knowledge about the changing environments and external pressure, as well as their internal core competencies to achieve their mission effectively. Solving problems and delivering effective and efficient healthcare is a multifaceted endeavour that is heavily dependent on access to knowledge (Bose, 2003). How effectively do nurses manage knowledge within the hospitals and more importantly, how can knowledge

management capabilities be leveraged to support nursing care performance? The focus of the present study is on knowledge management capabilities in nursing care. The reason for focusing on nursing care is because nursing care practice is information and knowledge intensive and populated with nurses with unique and specialised expertise. Moreover, knowledge management in healthcare as an area of research has received little attention (Wickramasinghe, Bali and Geisler, 2007).

Meihami and Meihami (2014) acknowledged knowledge recognition as the most valuable asset in an organisation. Knowledge offers an organisation the capacity to respond to changing environments. However, it remains one of the most neglected assets in organisations (Allee, 1997). The practice of knowledge management evolved to address challenges in knowledge intensive organisations (Sveiby, 2001). Kruger and Johnson (2009) opined that organisations control their resources and capabilities more effectively and create distinctive ways to provide more value if they can manage their knowledge more. The definition of data, information, knowledge, and the classification of knowledge to be dealt with in this study is discussed in the subsequent sections.

3.3.1 Data, Information, and Knowledge

For high-quality of nursing care, healthcare institutions must be able to rely on data, information and knowledge as well as their internal core competencies to achieve their mission effectively. Stankosky (2005) supported the view that we live in a knowledge-based economy and certainly knowledge management is not a fad. Nevertheless, what is data and information, and how does each relate to each other and to knowledge in nursing care in health organisations? Therefore, it is essential to distinguish between data, information, and knowledge before analysing the concept of knowledge management in nursing care.

In the literature, there are numerous debates regarding the definition of the concept of data, information, and knowledge. Generally, scholars agree that knowledge is more than just data or information, but it also involves the application of the expertise of individuals to use and capitalise on information (Ali et al., 2012). Loshin (2001:48) opined that, “knowledge starts from data, which is raw unanalysed facts that are measures or attributes of phenomena, which that are out of context and have no relation with other facts, relevance, is placed in context, and is analysed by people for a particular purpose”. Loshin (2001:49) further posited, “Information

is an analysed and processed data that forms a body of objective facts in a format suitable for decision making, or which are viewed in a context that defines the relationships between two or more pieces of data and possibly other information”. When information is processed in the mind of individuals, it is converted to knowledge (Alavi and Leidner, 2001). Making his contribution, Cho (2011), highlighted that it is imperative to differentiate between data, information and knowledge because they can help us distinguish that knowledge sharing and creation are mutually dependent information, social and cultural activities than simple information acquisition and sharing.

Bhatt (2001:69) conceded that defining data, information, and knowledge is difficult. He highlights that “data are considered as raw facts, information is regarded as an organised set of data, and that knowledge is perceived as meaningful information. Knowledge is considered a higher structure of information that is ready to be used for decisions or actions when and if individuals choose to do so”. Knowledge, unlike information which simply gives “the facts, allows for making predictions, causal associations, or predictive decisions about what to do” (Tiwana, 2002: 37). On the other hand, Gudea (2005:1) indicated:

“Data pertain to facts and given attributes, such as name, gender, birth date, address, phone number, temperature, and so forth. Attaching meaning to data transforms them into semantic data, or information. Knowledge, at the next level, implies contextualized information, which is information interpreted by the receiver and from the perspective of the receiver. The highest level on this continuum-wisdom-pertains to a state of refined, sublimated knowledge that affords the receiver the potential to optimize interaction with the environment”.

Data are facts that have not been interpreted in anyway and have not been internalised by an individual; information as data that has been put into context and acted upon; and knowledge as information that has been interpreted, acted upon through use in processes, routines, documents and repositories to add value to the organisation (Du Plessis and Boon, 2004).

3.3.2 Relationship between Data, Information and Knowledge

The conventional view of knowledge is seen as a hierarchical model with data at the base, information in the mid-point and knowledge at the top (Mason, 2003). On the contrary, Tuomi (1999) suggested a converse hierarchy for the relationships among data, information, and knowledge arguing that it is impossible to explain data and information without any previous knowledge. Liew (2007) described the relationship within these concepts as cyclical, relative to each other and context dependent. He concluded that data and information as well as information and knowledge are not substitutable in terms of their recognised distinct definitions. These differences assist in making clear our understanding in terms of handling data, information, and knowledge within an organisation. This is presented in Figure 3.1.

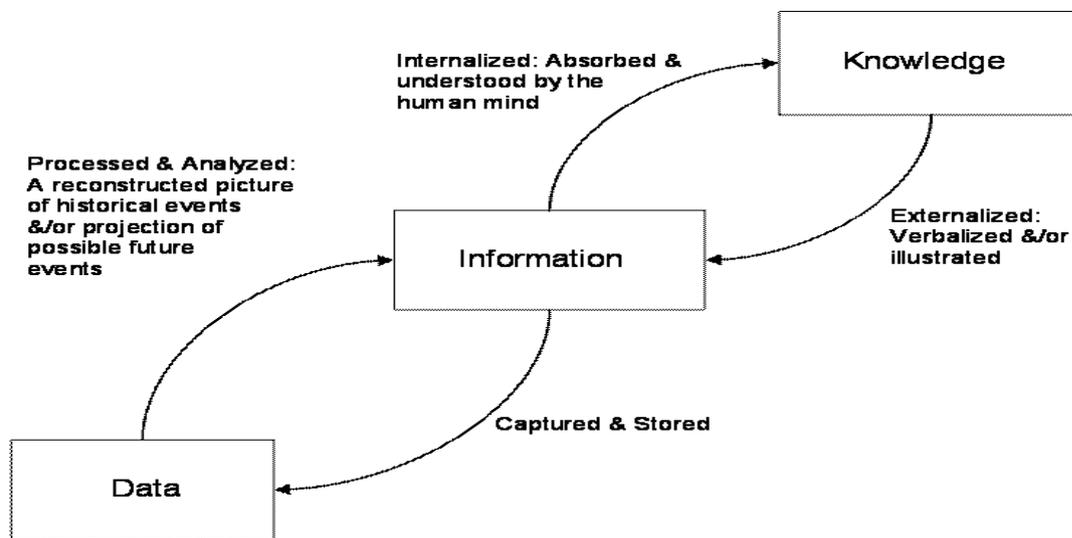


Figure 3.1: Relationship of Knowledge, Information, and Data (Source: Liew, 2007, p.8)

Milam (2006) cited in Cho (2011) argued that from a conventional view, knowledge starts from data which comprises of definite facts and numbers. If data are organised within some context, it becomes information, and with experiences, judgments and action, it ultimately becomes knowledge.

3.3.3 Classification of Knowledge

Polanyi (1996) emphasised that knowledge consists of tacit and explicit dimensions that cannot be separated. In agreement, Nonaka and Takeuchi (1995) defined tacit knowledge as knowledge that is not coded and explicit knowledge as knowledge that is codified. Although

knowledge has been categorised in many ways, the most common classification is that of tacit and explicit knowledge (Nonaka, 1994; Nonaka et al., 2000; Chou, 2005). The division of knowledge into tacit knowledge and explicit knowledge is relevant to the present study, as guided by the Gold, Malhotra and Segars (2001) organisational capability theory, it is important to identify these two dimensions of knowledge to understand how nursing practitioners draw on their knowledge in providing patient care.

3.3.3.1 Tacit knowledge

Tacit knowledge may be defined as knowledge that is unique, context specific, distinct and difficult to formalise and transfer (Nonaka and Takeuchi, 1995; Noe, 2002; Sabherwal and Sabherwal, 2007) and it draws on the accrued experience of an individual (Debowski, 2006). McAdam et al. (2007) described tacit knowledge as a practical knowledge developed from personal experience and activities; extremely distinct; subconsciously embedded and hard to communicate visually shared through interactive teamwork and creative processes. Reed and Defilippi (1990) identified that tacit knowledge gets deeply-rooted in people by learning from experience, intuitions, and heuristic procedures. Tacit knowledge is highly unique, abstract, and hard to express and diffuse; it consists of rational models, principles, insights, and assumptions which are mainly related to practicality (Haldin-Hergard, 2004; Davenport and Prusak, 2000, Nonaka, 1991). According to Nonaka (1994:16),

“Tacit knowledge can include cognitive and technical aspects. The cognitive aspect comprises of personal schemata, paradigms, beliefs, and viewpoints that help individuals to form their perspectives to understand and define the world that surrounds them. The technical aspect comprises of concrete know-how, crafts, and skills that apply to specific contexts”.

Cook and Brown (1999) proposed a third dimension of tacit knowledge which they signify as the social dimension. This dimension is created through social activities and it is exposed in actions. Social knowledge is ordered around a set of guidelines and a series of relationships that allow the organisation to function in a harmonised system (Brown and Duguid, 1998). Furthermore, Jain (2011) mentioned that tacit knowledge can be accomplished through face-to-face meetings, teleconferencing and electronic meetings and discussions.

A high-level of tacit knowledge acquired by employees through their experience within an organisation is difficult to be expressed and transcribed into a tangible resource (McCann and Buckner). Evans and Easterby-Smith (2001) citing Barley (1996) emphasised that the expression of tacit knowledge is an important factor in knowledge creation and exchange which is motivated by the goals of the organisation to develop its internal competencies to meet its objectives.

Exploring the significance of tacit knowledge for KM success, Jones and Leonard (2009) submitted that organisations must have the capability to capture employees' knowledge and experience for tacit knowledge retention and transform it into organisational knowledge for use when the employee exits the organisation. Organisational knowledge is the accumulation of knowledge possessed by the organisation which has been obtained from current and previous employees (Johnson, 1996). Yoshioka-Maeda et al. (2006) noted that clinical practitioners draw on their tacit knowledge to address health problems. Tacit knowledge helps clinicians make decisions that are efficient, effective, and patient-centred with greater confidence (Clarke and Wilcockson, 2002).

3.3.3.2 Explicit knowledge

Explicit knowledge, can be coded easily, communicated, and shared in form of formal and organised language within an organization (Nonaka, 1994; Nonaka and Takeuchi, 1995). In agreement, Mutula and Mooko (2008) referred to explicit knowledge as knowledge which is easily expressed by words or documents easily codified and articulated in language and can be packaged, transferred and shared among individuals. Typically, explicit knowledge contains words, pictures, diagrams, codes, process manuals etc. so it can be transmitted in formal ways (Gottchalk, 2005); thus, it can be easily transmitted formally across individuals; can be processed by a computer, stored in a knowledge database or managed by a knowledge management system (Mitch and Ferreira, 2001; Blumentitt and Johnston 1999; Anad et al., 2010). Although explicit knowledge is represented in intelligible and symbolic forms that can be communicated with others, it can signify various meanings to different individuals (Weiss and Prusak, 2005).

Nonaka and Takeuchi (1995:61) argue that, "tacit and explicit forms of knowledge are inextricably linked, and that knowledge is created and expanded through social interaction

between tacit knowledge and explicit knowledge using four modes of knowledge conversion”. Tacit knowledge is an important baseline for the development and interpretation of explicit knowledge. Organisations have traditionally focused on the explicit part of knowledge and ignored tacit knowledge although it has been estimated that only about ten percent of an organisation’s knowledge is explicit. The knowledge conversion process articulates the relationship between tacit knowledge and explicit knowledge, the transfer of either form of knowledge between individuals or within (or between) organisations. These knowledge resources complement one another in deriving value for organisations (Govender, 2010:49).

Anderson (2009) emphasised that explicit knowledge is frequently accessible through information clinical practice guidelines, written policies, and procedures within healthcare settings. Tacit knowledge, on the other hand, exists in the reasoning and consciousness of health practitioners often gained by cogitation on clinical practices and evidence. A handful of studies executed in the domain of healthcare highlight that tacit knowledge has been shown to aid the interpretation of explicit knowledge Greenhalgh et al. (2008). Goldman (1990) emphasised that important clinical judgement is supported by explicit knowledge through use of defined process, practice, and evidence.

Nurses draw upon both explicit and tacit knowledge from various sources to inform their practice. It is noteworthy that this study does not seek to identify different knowledge nurses use in practice since different categories of knowledge are utilised by nurses at various times which is dependent on the clinical case at hand and the personal experiences. Rather, this study aimed to examine the influence of various components of knowledge management capability on nursing care for providing quality patient care. In the next section the author discusses the overview of knowledge management.

3.4 Overview of Knowledge Management

Following the discussions in previous sections on the definition of data, information and knowledge, and knowledge classifications and nursing knowledge in patient care, this section considers the related topics of the KM discipline consisting of the definitions of KM and KM practices in nursing care.

3.4.1 Definition of Knowledge Management

Knowledge management as a discipline is nebulous, complex with varied theoretical basis and there is no consensus regarding the concept's definition (Yahya and Goh, 2002; Grossman, 2006; Desouza, 2005; Jain and Mutula, 2008; Onyancha and Ocholla, 2009). Given the implicit and explicit aspect of KM in the definitions of a learning organisation, knowledge capital in the competitive operations of organizations becomes imperative (Jain and Mutula, 2008). Onyancha and Ocholla (2009) citing Grossman (2007) contributed that due to the lack of the understanding of the concept, KM is gradually becoming prevalent in its application in disciplines (computer science, engineering, business administration etc.). In support, Davenport and Prusak (1998) highlight that despite the difficulty in the definition; knowledge management allows an organization to exploit its intangible assets to create value through improved organisational performance. Different definitions found in the literature are displayed in Table 3.1.

Table 3.1: Definitions of knowledge management

Author	Definition
Vander Spek and Spijkervet (1997:43)	“The explicit control and management of knowledge within an organization aimed at achieving the company’s objectives.”
Offsey (1997:113)	“The broad process of locating, transferring and more efficiently using of locating information and expertise within an enterprise”.
Quintas et al. (1997:387)	“Is the process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities”.
Davenport and Prusak (1998:5)	“A fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences...It originates and is applied in the mind of knowers”.

Guns and Valikangas (1998:287)	“The process that seeks to facilitate knowledge flows and sharing to enhance productivity of individuals and hence the enterprise”.
Wiig (1999:1)	“The systematic, explicit and deliberate building renewal and application of knowledge to maximize an enterprise knowledge-related effectiveness and return from its knowledge assets”.
Skyrme (1999:59)	“The explicit and systematic management of knowledge and its associated process of creating, gathering, organizing, diffusion and use in pursuit of organization objectives”.
Rasgoti (2000:40)	“A systematic and integrative process of coordinating organization-wide in pursuit of major organizational goals including the acquisition, creation, storage, sharing, diffusion, development, and deployment of knowledge”.
Duffy (2000:64)	“A process that drives innovation by capitalizing an organizational intellect and experience”.
Alavi and Leidner (2001:114)	“Knowledge management is largely regarded as a process involving four basic processes of creating, storing/retrieving, transferring, and applying knowledge”.
Tsoukas and Vladimirou (2001:973)	“The dynamic process of turning un-reflexive practice into reflective one by elucidating the rules guiding the activities of the practice, by helping to give a particular shape to collective understandings, and by facilitating the emergence of heuristic knowledge”.
Wickramasinghe (2002)	“Provides an integrated approach that can identify, manage and share organizational information assets including databases, documents, policies and procedures as well as expertise of individual worker”.

Walters (2002:7)	“The organizational capability which identifies, locates (creates or acquires), transfers, converts and distributes knowledge into competitive advantage”.
Becerra-Fernandez, Gonzalez and Sabherwal (2004: 31)	“Performing the activities involved in discovering, capturing, sharing, and applying knowledge so as to enhance, in a cost effective, the impact of knowledge on the unit’s goal achievement”.
Buckman (2004:17)	“Systematic approaches to help information and knowledge emerge and flow to the right people at the right time to create value”.
Chaffey and Wood (2005:227)	“The capabilities by which communities within an organization captures the knowledge that is crucial to them, constantly improve it and make it available in the most effective manner to those people who need it, so that they can exploit it creatively to add value as part of their work”.
Teo (2005:148)	“The process of making creative effective and efficient use of knowledge available to an organization for the benefits of its customers and the organization as a whole”.
James (2005:51)	“The identification, acquisition, utilization, support, maintenance and disposal of knowledge assets for adding value and benefiting all stakeholders”.
Debowski (2006: 16)	“The process of identifying, capturing, organizing and disseminating intellectual assets that are critical to the organization’s long-term performance”.
Lakshman (2007:55)	“An organizational capability that allows people in organizations, working as individuals, or in teams, projects, or other such communities of interest, to create, capture, share, and leverage their collective knowledge to improve performance”.
Sabherwal and Sabherwal (2007:411)	“Involve the sharing, application, or creation of knowledge”.

While a plethora of definitions exist for what constitutes knowledge management, it is obvious that majority of these elaborate that knowledge management involves leveraging knowledge toward the attainment of organisational goals and objectives. Furthermore, it encompasses managing tacit knowledge assets, knowledge repositories or as knowledge process of acquisition and application (Ojo, 2016).

This research adopts Skyrme's (1999:59) definition of knowledge management as "the explicit and systematic management of vital knowledge and its associated process of creating, gathering, organising, diffusion, and use in pursuit of organisation objectives".

3.4.2 Knowledge Management in Nursing Care

Knowledge management in healthcare involves "aligning people, processes, data, and technologies to optimize information, collaboration, expertise, and experience in order to drive organizational performance and growth" (Guptill, 2005:11). Knowledge management is not just about the utilisation of technologies or a set of procedures. Health organisations such as hospitals should ensure the components of people, processes and up-to-date technologies are put in place and operational to achieve the best practice (Acharyulu, 2011).

According to Lee (2017:27),

Healthcare systems such as hospitals are "knowledge-intensive environments involving rapidly changing medical technologies, and requiring tools, skills, and methods with more knowledge resources. Unlike other organizations, high differing processes are required by hospitals such as healthcare provision, diagnosis, and treatment of ailments, planning, and implementation of admission procedures, medical interventions and other procedures including making complex decisions within the networks. Implementation of successful KM had been limited due to the type of organizational culture in the hospital settings".

In hospital organizations, Salehi et al. (2015) highlighted that in healthcare nurses are one of the major sources of organisational knowledge and essential elements of knowledge transfer in hospitals and operate in constantly changing clinical environments. In agreement, Simpson (2011) also highlighted that knowledge is central to the work of nurses and professional accountability in nursing practice. More explicitly, various research in healthcare has showed that the nursing workforce are a major reservoir of indispensable knowledge (Hall, 2003) and

nursing care delivery entails the development, application and harmonisation of knowledge for high-quality care (Sorells-Jones and Weaver, 1999). Therefore, enhancement of knowledge plays a pivotal role in achieving professional development, job satisfaction, and continuous improvement of nursing practice. Understanding knowledge work and processes in patient care form a crucial view for nurses in providing effective, safe, and quality care.

There have been many studies on clinical nursing knowledge particularly in the provision of safe patient care (Buerhaus et al., 2006; Jennings, Staggers and Brosch, 1999; Radwin, 1996, 1998; Whittemore, 2000; Estabrooks et al., 2002; Hall, 2003; IOM, 2004; Rycroft-Malone et al., 2002; Sorrells-Jones and Weaver, 1999; Champagne, Lemieux-Charles and McGuire, 2004). There is paucity of research to clarify the role of knowledge management in nursing care. However, some relevant studies on knowledge management in nursing are identified.

In Canada, Lafave (2008) investigated nursing knowledge work within the clinical microsystem by seeking to establish the perspectives of the nurses regarding the components of the knowledge categories required by nurses; and how nurse-to-nurse systems information exchange occurs from the perspective of 18 nurses working in a neonatal intensive care nursery in a medical centre. LaFave (2008) revealed the knowledge of the nurses' regarding their workplace includes knowledge about peer teaching, problem solving, modelling behaviours, coordinating operations and development within the clinical units and the relationship between the staff and patients. Lafave also indicated that the main process by which systems-based knowledge was transmitted was through communication. These findings demonstrate management and knowledge in nursing are essential for safe patient care in dynamic situations.

Given the critical role of nurses in the acquisition and dissemination of knowledge in healthcare, clinical knowledge management in nursing practice has gained popularity within recent years (Ghosh and Scott, 2005). Ghosh and Scott (2007:78) indicate that,

“In the nursing function the key knowledge creation transaction is between the nurse and the patient. Tacit knowledge is created during the interaction between the nurse and the patient and is stored in the knowledge management system by the nurse. The knowledge is then made available to other nurses as well as other physicians and specialists through tacit and explicit forms in future patient interaction scenarios. The knowledge is also disseminated to patients to promote better health compliance”.

In healthcare settings, the use of KM involves the application of knowledge in identifying new challenges (Gallupe, 2001).

Nursing professionals work within the clinical units in hospitals solving complex and emerging clinical cases. Nursing practice requires considerable levels of cognitive actions, and involves application of expertise to solve problems in providing high-quality care (Sorrells-Jones and Weaver, 1999). Silva and Ferreira (2008) utilised a bibliographical survey and literature review to discuss the expertise knowledge required for nursing practice. They highlighted that knowledge is an integral part of nursing work, either the cognitive knowledge or practical knowledge is one of the principles for quality care. Siu (2015:12) citing Benner et al. (1996), described

“Knowledge in nursing care as the culmination of practical experience of evidence from research which over time becomes the “know-how” of the clinical experience of caring that defines the profession of nursing. This “know-how” knowledge asset is dynamic and initially develops in the novice critical care nurse, expands within competent and proficient nurses, and is actualised in the expert nurse”.

Simon (2016) conducted a case study on the “relationship between knowledge management tools and inter-professional healthcare team decision making in the United States”. Utilising quantitative and qualitative methods, the study aimed to investigate the influence of satisfaction on the delivery of collaborative care decisions and team climate on KM implementation success. The study found that implementation of KM tools leads to improved decision-making in-patient

care and a team’s climate for innovation, teamwork, and sharing could be impacted for better outcomes. In conclusion, Simon (2016) submitted that the utilisation of KM tools to support decision making in clinical care enables improved patient care outcomes and cost reduction in the healthcare delivery system.

According to Sorrells-Jones (1999), KM in nursing care includes routine and non-routine work. Routine work encompasses activities such as taking vital signs and administering medications, while non-routine work encompasses activities such as the use of knowledge in identifying a problem and clinical judgement. Nurses need to develop the capabilities to survive in a

knowledge-based society, but at the same time, organisations also need to increase investment and put more effort into ensuring that the information and knowledge available in databases, patents, or in the minds of people is fully utilised and translated into products and services that give value to the organisation. Dehaghi, Sheikhtaheri and Dehnavi (2015), further added that nursing care in teaching hospitals is a knowledge-driven process and hence KM practices provide an opportunity for improvement in health core process performance.

The major factors influencing knowledge management in the clinical nursing function in a large hospital in the United States was studied by Ghosh and Scott (2005). The findings revealed that technology can play a key role in nursing care function, provided it supports the processes involved with knowledge acquisition and application to solving new problems. The study highlighted the individualistic nature of the nursing processes, therefore organisational structure, information technology, and organisational culture need to be emphasised during KM systems implementation. Ghosh and Scott (2005) noted that nursing care delivery provides opportunity to incorporate KM practices to improve processes and concluded there is paucity of evidence supporting KM in nursing care delivery; hence, the focus of this study.

Anderson and Wilson (2014) explained that the goal of KM practice in nursing care delivery is the provision and promotion of excellent, timely, and optimal healthcare to the nursing professional when and where they need it to help them make high quality well-informed patient care decisions. Many factors come into play to ensure efficiency and effectiveness of healthcare services due to the diversity of the nursing care environment. Anderson and Wilson (2014) further submitted that optimal healthcare outcomes are achieved by healthcare managers through the development of the capabilities to manage knowledge resources.

Koushazade, Omidianpoor and Zohurian (2015) examined the “effect of organisational factors on KM effectiveness among nurses of Golestan hospital of Ahvaz, Iran”. The association between organisational factors such as social interactions (trust, communication, and coordination), infrastructure factors such as IT, structure, and culture, process factors (acquisition, conversion, application and protection of knowledge), and KM effectiveness, employing a survey design, quantitative data collected from 220 nurses revealed that social interactions, infrastructural factors and process factors are significant predictors of the effectiveness of KM among nurses at both individual and organisational levels. The largest

impact of organisational factors on KM effectiveness was identified for infrastructural elements including structure and culture followed by social interactions.

McElroy (2003) and Sandars (2004) cited in Orzano et al. (2008) explained that simply acquiring, disseminating and utilising best clinical and operational information is no longer sufficient to accomplish success in health organisations. Instead, healthcare research demands that the work place should encourage creativity in order to develop new knowledge. El Morr and Subercaze (2010) added that the implementation of knowledge management in healthcare results in several benefits including enhanced decision-making; seamless collaboration between different healthcare professionals; improved quality of care; reduction of medical error and medical cost; enhanced effectiveness and efficiency in healthcare delivery; promotion of an evidence-based practice; dissemination of best practices; improved organisational performance and better accountability in using public resources. In their contribution, Dehaghi et al. (2015) indicated that in the healthcare domain, evidence showed a strong relationship between the quality of work of nurses and their participation in KM.

In South Korea, Lee, Kim and Kim (2014) using a cross-sectional survey examined the core KM factors influencing the outcomes of nursing performance. They submitted that a culture of knowledge sharing, and organisational learning were fundamental KM factors impacting on nursing performance. In conclusion, Lee, Kim and Kim (2014) emphasised that the identification of other core KM factors is necessary to manage and share nursing knowledge successfully which is vital to improving outcomes of nursing performance.

Anderson and Wilson (2009) investigated the framework of KM for identifying, organising, analysing and translating nursing knowledge into daily practice and concluded that KM is important for nurses to engage in up-to-date competent clinical decisions for ensuring excellence in patient care and continuous quality improvement. Similarly, Gagnon et al. (2015) examined the 'impact of a learning organisation and KM among nurses in Canada by using semi-structured interviews; they submitted that organisational learning through knowledge transfer in the work environment is required for changes in nursing practices and work environment. According to Cruz and Ferreira (2016), KM implementation programmes within organisations is highly demanding and the success is dependent on a broad range of factors such as the type of institution, type of product, services offered and client. This underpins the

need and importance of reviewing these factors in detailed contexts, also given the paucity of empirical evidence on how these factors influence knowledge management.

Globally, there is an increased attention in the healthcare literature about the value of knowledge management in improving organisational performance and competitiveness. A major number of published research articles within the health sector tend to emphasise on the abstract aspects of KM that, although valuable, lack a pragmatic component (Kothari et al., 2011). However, studying KM in clinical nursing functions has not been sufficiently considered in literature (Lee, Kim and Kim, 2014).

3.5 Knowledge Management Capabilities: Infrastructure and Processes

Knowledge management capability is the capacity to assemble, integrate and use knowledge resources effectively and implement knowledge processes competently to improve organisational performance (Dawson, 2000). Similarly, Alavi and Leidner (2001) defined KM capabilities as an organisations' ability in exploiting and deploying knowledge resources in KM activities to improve organisational performance. KM capabilities are organisational strategies for creating knowledge incessantly (Ichijo, Krogh and Nonaka, 1998). Organisations must be able to use their current knowledge and create new knowledge that favourably positions them in order to compete effectively. Furthermore, organisations must have the capability to utilise previous knowledge to identify the value of new information, integrate it, and apply it to create new knowledge and capabilities (Cohen and Levinthal, 1990).

Various researchers have suggested capabilities influencing KM as prerequisites for efficient knowledge management (Gold, Malhotra and Segars, 2001; Gray, 2001; Holsapple and Joshi, 2000; Ichijo et al., 1998; Krogh, Nonakam, and Aben, 2001; Lee and Choi, 2003; Malone, 2002; Wiig, 1997; Zack, 1999). The knowledge management capabilities are divided into the dimensions of knowledge infrastructure capabilities and knowledge process capabilities (Gold et al., 2001; Lee and Sukoco, 2007; Aujirapongpan et al., 2010; Mills and Smith, 2011; Smith, Mills and Dion, 2010). The development of organisational knowledge management capabilities will contribute to organisational effectiveness (Yang and Chen, 2007).

Gold, Malhotra and Segars (2001) examined the issue of KM effectiveness from the perspective of organisational capabilities. They submitted that, "a key to understanding the success and failure of knowledge management within organisations is the identification and

assessment of preconditions that are necessary for the effort to flourish. These preconditions are described broadly and classified into knowledge infrastructure and knowledge process capabilities” (Gold et al. 2001:79). Using a formal survey, Gold et al. (2001) collected data from 1000 senior executives in which 323 were deemed usable. The study reported a significant relationship between both knowledge infrastructure and knowledge process capabilities with organisational effectiveness. The research was limited as the sample was limited to larger companies and senior executives only. The study did not investigate the link between knowledge infrastructure capability and knowledge process capability.

Lee and Choi (2003) investigated the relationship among knowledge management enablers, processes, and organisational performance. The researchers collected data from companies listed on the Korean Stock Exchange. The researchers adopted both interviews and mail surveys. Each item on the questionnaire was based on a six-point Likert scale, from “very low” to “very high”. Surveys collected from 58 organisations were analysed. The results indicated that the organisational culture variable is essential for knowledge creation. People and structure variables do not significantly affect knowledge creation. The information technology variable is the only significant variable related to the combination variable of knowledge creation. Moreover, knowledge creation is positively related to organisational creativity, which is positively related to organisational performance. The finding confirms that an organisation can achieve strategic benefits of knowledge management through effective knowledge creation.

Nguyen (2010) in a study entitled “knowledge management capability and competitive advantage in Vietnamese enterprises” examined a KM measurement model which was proposed in a developed country in the context of Vietnamese. The findings revealed that the measurement model is applicable to the settings of developing countries. The findings also strongly support the perspective of knowledge-based view theory suggesting that organisational performance is a result of the capacity to create and apply integral knowledge resources. The recommendations that resulted from the study suggested that KM processes are entwined, and knowledge application process should be emphasised in the exploitation of various knowledge resources to achieve the objectives of the organisation.

In Egypt, Zaied (2012) examined the correlation between knowledge management capabilities and organisational performance. Knowledge management capabilities included infrastructure, processes, and knowledge management functions. Quantitative data using survey questionnaire

was used to solicit data from 27 organisations. The questionnaire was adopted from Gold et al. (2001), Lee and Choi (2003), Lee and Lee (2007) and Smith et al. (2010). The study examined the perception of the respondents about the level of KM functions in their organisations and the corresponding value for each dimensions of KM (infrastructure and process) on a five-point Likert-type scale anchored from “5- Strongly agree” to “1- Strongly disagree”. The findings revealed a strong positive association between the dimensions of KM and knowledge management functions. The results also revealed that a strong positive association exists between knowledge management functions and organisational performance. Zaied (2012) submitted that a crucial issue in the implementation of KM initiatives is the prior preparation of the organisation to accept and utilise new KM processes. They concluded that many organisations still view KM as information technology initiatives.

This study applies Gold et al. (2001) model for these two capabilities. The following subsection discusses the two capabilities: knowledge infrastructure and knowledge processes.

3.6 Knowledge Infrastructure Capability

Knowledge infrastructure (otherwise called enablers) capabilities encompasses the factors that drive knowledge management activities in the organisations and contribute to sustainable performance (Matin and Sabagh, 2015). Krogh et al. (2001) noted that knowledge infrastructure capabilities are “organisational mechanisms that create knowledge constantly and intentionally in an organisation,” and emphasised five aspects of KM infrastructure consisting of knowledge generation; knowledge conversion; organisational structure; human resources and collaboration between employees. Knowledge infrastructure capability offers IT or non-IT infrastructure that supports KM practices (Carrillo, Robinson, Anumba, and Al-Ghassani, 2003).

In support of the above argument, other KM authors also posit that KM enablers (otherwise known as (knowledge infrastructure) are the organisational strategies that can encourage the creation, transfer and protection of knowledge (Lee and Choi, 2003). A wide range of knowledge infrastructure capabilities has been acknowledged in the literature including organisational culture, organisational structure, and technological infrastructure and processes. Yet, a review of the literature revealed a dearth of empirical research regarding the relationship

of any of these components with nursing care performance in the field of healthcare and fewer studies considered these elements collectively.

Lee (2017) in a study examined “the influence of knowledge management infrastructure (structure, leadership, learning, information technology systems, trust, and collaboration) on the knowledge management process (creation, storage, sharing, and application) in four hospitals in Korea”. Quantitative data using a questionnaire was collected from a sample of 778 employees using random sampling from four hospitals. The results revealed in each of the hospitals, KM processes differently affect the organisational factors. Lee (2017) recommended that friendly organisational culture and systems must be espoused by the hospital managers and incessantly educate employees about KM based on trust and collaboration.

Jaradat and Maani (2014) conducted a study exploring “the impact of knowledge management infrastructure on performance effectiveness of the Jordanian organisations”. The findings indicated that there was a strong effect for knowledge management infrastructure on performance effectiveness. They suggested that organisations should establish knowledge directorates to discover and transmit knowledge to workers with a view to improving the creativeness and distinctiveness of organisations.

This study adopts the three constructs of knowledge infrastructure capability by Gold et al. (2001); these constructs are information technology, organisational structure, and organisational culture. The next subsections present a brief outline of each constructs.

3.6.1 Information Technology

According to Gold et al. (2001:187), “information technology comprises a crucial element of the structural dimension needed to mobilize social capital for the creation of new knowledge”. Technological dimension in knowledge infrastructure comprises of technical systems which allows knowledge combination and integration of fragmented flow of information (Matin and Sabagh, 2015).

Technology is a significant enabler of KM processes (Cho, 2011; Khalifa and Liu, 2003); and functions as a means in which knowledge can be efficiently retrieved, disseminated and stored (Chua, 2004). It is crucial to recognise the technological issues in implementing efficient KM systems. Technological tools are required by employees to seamlessly share knowledge with

one another and retrieve it at any point in time. Furthermore, these tools improve KM activities and usually people are at the heart of knowledge creation process as various people collaborate during knowledge creation (Majchrzak et al., 2013).

As pointed out by Khalifa and Liu (2003), technology is an essential enabler of KM capabilities but not sufficient alone to directly influence the success of KM. Numerous authors have stressed the importance of IT in supporting KM activities (Gold et al, 2001; Anderson, 2009; Lee and Choi, 2003; Nguyet, 2010; Cho, 2011; Siu, 2015) while a majority of studies investigated the influence of IT on discrete KM processes such as knowledge sharing and application, knowledge creation and conversion, others primarily investigated the influence of IT on general aspects of KM (Khalifa and Liu, 2003). Alavi and Tiwana (2003) argued that although IT tools may be used to assist KM processes in the organisation, these tools are not interactively exclusive and are needed to be combined synergistically for KM initiatives in some large organisations.

Recent developments in information technology have transformed healthcare delivery (Lupiáñez-et al., 2011; Smedley, 2005). Due to information explosion, information technologies are becoming indispensable for quality healthcare delivery by nurses. Furthermore, the healthcare landscape is changing rapidly, and computer literacy has become a job requirement for nurses in many institutions; they are challenged to incorporate information and communication technology into their regular routine (Elfrink, and Martin, 1996; Elfrink et al., 2000; Huges, 2003; Porter O'Grady, 2002; Saranto and Leinpo-Kilpi, 1997; Smedley, 2005). Technology allows nurses to find, interpret, organise, and appraise information from different sources for better and informed decision-making and problem-solving within patient care (Lee, 2005; Mills and Staggers, 1994; Nahm and Posaton, 2000). As stressed by Rouleau, Gagnon and Côté (2015), information technology improve the collaboration between the nurses and also the interaction between the nurses and patients which improve quality and safety of healthcare. It allows the knowledge sharing and expertise and improves timeliness, quality, and access to variety of healthcare services.

Hsia et al. (2006) proposed a framework of KM systems in nursing care and emphasised the need for healthcare organisations to identify technical infrastructure needed for the nursing knowledge management systems. The framework specified the critical knowledge management activities in nursing process and enabling IT-based on the task/tech fit theory.

They concluded KM technical functions are necessary for a nursing KM system and a variety of enabling IT that can be used to support nursing practices and KM activities. The most crucial part of KM practices in organisations is educating employees on the productive use and application of knowledge, while IT plays a key function in the transfer of knowledge (Iftikhar, 2003). Knowledge management is neither possible nor active without the support of information technology (Thomas, Sussman and Henderson, 2001).

Rouleau et al. (2017) appraised the impact of technological resources on nursing care delivery using a literature review by assessing 5515 papers. According to Rouleau et al. (2017), the overview allowed a broad understanding of the dimensions of nursing care influenced by using ICTs for providing care. They concluded that the use of ICTs for healthcare delivery by nurses will change how nurses plan, deliver, document and review clinical care. They further highlighted that findings of the literature review were a good starting point from which researchers could deepen their conceptualisation on the way nursing care system performance can be affected by ICTs. According to a systemic perspective, it is plausible to believe that the adoption and implementation of ICTs in the nursing care system must be addressed under a multidimensional perspective, considering that the three subsystems are interrelated.

Similarly, a review by Fagerström et al. (2017), suggested that ICT can contribute to nurses' ability and capacity to deliver good, quality care and safety (Johanssen et al., 2011; Star et al., 2013; Stevenson and Nilsson, 2012). Fagerström et al. (2017) concluded that an integrated body of knowledge was lacking with respect to the effects of ICTs on nursing care, because of the heterogeneity of ICTs used in the literature as well as the poor conceptualisation of nursing care.

3.6.2 Organisational Structure

Organisational structure is “the design of organisational work flow and processes, as well as the pattern of interrelationships among key components of the system” (Senge, 1994: 90). Organisational structure consists of rules, policies, procedures, and processes, hierarchical levels, departmentalisation of employees and systems of motivational incentives, and coordination of work processes within the firm. Organisational structure aims to provide functional units and work roles within an organisation, but it has often had the unintentional

consequence of constraining knowledge sharing and collaboration across internal organisational limits (Gold et al., 2001).

Organisational structure reflects how the work roles and tasks are allocated among organisational members and the coordination of their different work procedures (Nahm, Vonderembse and Koufteros, 2003; Vera and Crossan, 2004). Employees in an organisation have work divisions and specific roles in order to achieve the organisation's goals and objectives. Putting in place structures that enhance effective performance of major activities and staff efforts is imperative for the management (Thomas, 2015). Hunter (2002) highlighted that organisation of work is an important factor that determines the output of the organisation that impacts the output of the organisation as leadership determines the way the employees work. Broadly speaking, organisational structure is mainly imperative for decision making process because it includes the characteristics of authority centralisation, hierarchy levels, and horizontal integration (Hao et al., 2012).

Mahmoudsalehi et al. (2012:521) posited that,

“Three most important aspects in organizational structure comprises of centralization, formalization and integration. Centralization refers to the concentration of management and power of decision-making process at the top of an organization's hierarchy. Organization with high centralization tends to restrain interactions among the organization members, hinders inventive solution to problems, and diminishes the opportunity for individual development. On the other hand, low centralization will encourage employee's creativity and involvement in organization projects. Formalization involves the level of work roles within an organization that are structured, and activities of the employees are governed by rules and procedures. Organization with high formalization, introduces an innovation within organization by setting comprehensible rules and procedures to reduce ambiguity and flexibility of employees”.

Numerous researchers have recognised organisational structure as a key enabler of KM (Bose, 2003; Chourides, Longbottom, and Murphy, 2003; Holsapple and Joshi, 2000; Liebowitz, 1999; Wong, 2005). Since the organisational structure can influence individual performance it should be intended to support active knowledge flow and transfer (Mitch Casselman and Samson, 2007). In addition, the organisational structure should be purposefully set up to

support knowledge processes within the organisation because existence of structural barriers hinders the maximum exploitation of knowledge resources (Suresh, 2002). Furthermore, Gold et al. (2001) is of the opinion that organisational structures that reward individuals for hoarding information can inhibit effective KM across the organisation and it is imperative in the effectiveness of technological infrastructure.

KM studies frequently report the necessity for flatter organisational structures based on loosely coupled teams that form networks of functions for the organisation (Van Beveren, 2003). Schein (2003) identified three dimensions of organisational structure: the hierarchical dimension which encompasses the ranks within an organisation in a manner similar to an organisational chart; the functional dimension which identifies the different types of work to be done; and the inclusion and centrality dimension which shows the distance of any given person from the core of the organisation.

According to Botha and Fouche (2002), the structure of an organisation is divided into the three layers of “network forming devices”: “1. Formal hierarchical structure with reporting relationships, responsibilities and accountabilities; 2. Flexible structure that consists of ad hoc problem-solving teams, task forces, joint planning groups etc; 3. “Hidden” (implicit) structure that consists of informal peer groups, interest groups, professional groups and personal networks internal as well as external to the organisation.”

In existing literature, substantial arguments and suggestions indicate that a formal hierarchical structure hinders effective knowledge management in an organisation (De Long and Seeman, 2000). Since formal structure can inhibit knowledge flow in an organisation, it is very important how effectively the organisation employs flexible and flat structures to facilitate the flow of knowledge. Botha and Fouche (2002) further pointed out that a flexible structure inspires employees to create and share their knowledge, while hidden structures encourage the exploitation of opportunities created by a workplace setting of open spaces where co-location and informal meeting places are part of daily organisational routine. According to Cross and Baird (2000), hidden structure has achieved more popularity in the last few years with developed interest in communities of practice, which represent informal groups that interact and collaborate regularly around work-related issues and challenges.

In submission, Kim and Lee (2006) highlighted that organisations with flexible structures encourage sharing of knowledge within the organisation and would enhance collaboration among experts in different units and facilitate the flow of ideas across units, while formalised and centralised structures are the main hindrances to knowledge sharing. As a result, a flexible organisational structure is encouraged for sharing of knowledge which is integrally dynamic and collaboration within and outside the organisation (Bhatt, 2000; Gold et al., 2001).

An organisational structure that enables knowledge flow is formed by an organisation's policies, processes, and systems of rewards, which control the channels from which knowledge is accessed and how it flows (Leonard, 2007; Kim and Lee, 2006; Nonaka and Takeuchi, 1995; Chigada, 2014).

Donabedian (1972) submitted the idea that the quality of care can be assessed by exploring health care structures, processes, and outcomes. Hospital structures such as nursing units with better work environments and better labour or capital such as nurse staffing and education achieve better patient outcomes. Hospital environments supportive of professional nursing practice, and maximally utilising their professional competences in service to patient care, are critically important in providing safe, high quality patient care (Aiken et al., 2011; McHugh et al., 2013). Tomey (2009) in a study investigated nursing leadership and management effects in work environments in the United States. Nurse leaders in the senior and middle cadre, working within program management structures revealed they had more organisational support, job security, and support for professional nursing practice structure. On the other hand, nurse leaders working in organisations with traditional departmental structures were more authorised with greater influence in staff and policy decisions, and more confidence in the patient's ability to manage care after discharge.

Laschinger and Wong (2008) studied "the relationships among structural and process characteristics of nurse leader roles and work-related outcomes in Canadian hospitals". Data were collected in 10 provinces from acute care inpatient units within 28 Academic Health Centres and 38 community hospitals. A sum of 1164 responses were analysed, and the results revealed that in academic health centres, senior nurse leaders were likely to have responsibility for allied health than senior nurse leaders in community hospitals; the leader role configuration for major senior nurse leaders (86%) was operational/line authority for clinical programs with a direct reporting to the Chief Executive Officer or senior vice-president. A smaller number of

senior nurse leaders (16%) had staff authority, reporting directly to the Chief Executive Officer or senior vice-president primarily in Quebec and in community hospitals.

Shukri and Ramli (2015) focused on top management using Balanced Score Card in the investigation of organisational structure and performance of Malaysian private hospitals. Quantitative data using a structured questionnaire was collected from 97 private hospitals registered with the association of private hospitals in Malaysia. The results revealed that the hospitals structure was highly centralised and formalised. The private hospitals make use of formalised rules and written formal procedure to ensure the management and governance of health providers act in accordance with espoused values. Organisational structure was also found to lead to an improved performance on the key aspects; internal business processes, patient quality services, safety and satisfaction, organisational learning and growth.

3.6.3 Organisational Culture

Organisational culture in KM infrastructure refers to “the firm’s vision and values, the attitudes toward learning, and the cultural influences on interaction and collaboration. It represents the interactions and contacts that enable building and sustaining relationships” (Gold et al., 2001:189). Denison (1990:2) defined organisational culture as “the underlying values, beliefs, and principles that serve as a foundation for the organisation’s management system, as well as the set of management practices and behaviors that both exemplify and reinforce those principles”. “The organisational culture refers to the unique combination of values, beliefs and models of behaviour in an organisation and represents the organisation’s core values that dictate the behavioural norms of employees” (Yeh et al., 2006:797). According to Nonaka and Takeuchi (1995:167), “organisational culture orients the mindset and action of every employee. These definitions clearly establish that organisational culture is a crucial factor in knowledge management.

According to Skyrme (1999:184) “an organisational culture that fosters knowledge sharing and enhancement, displays the following characteristics:

- A transparent organisational milieu
- An empowered workforce
- A dynamic learning environment
- A continual quest for novel means of development and innovation

- Concentrated, transparent and extensive communication
- Periods of reflection, learning and experimentation
- Communication and interaction across and within groups
- Objectives and performance gauges that are synchronised across the organisation
- An inclination toward extensive knowledge sharing among individuals who make up the workforce”.

The effectiveness of KM in the organisation is restricted if an organisation has an all-inclusive KM system in place but does not have a supportive organisational culture (Alavi, 1997). Employee interaction should be encouraged, both formally and informally, so that relationships, contacts, and perspectives are shared by those not working side by side. Interaction and collaboration is important when attempting to transmit tacit knowledge between individuals or convert tacit knowledge into explicit knowledge, thereby transforming it from individual to organisational level (Gold et al., 2001; Nonaka, 1990; Nonaka and Takeuchi, 1995; O’Dell and Grayson, 1998).

Gopal and Gagnon (1995) observed that a supportive culture characterised by organisational members and recognition of the value of KM is important to organisational performance. Organisations should establish an appropriate culture that encourages people to create and share knowledge within an organisation (Holsapple and Joshi, 2001; Leonard-Barton, 1995). Therefore, organisational culture becomes one of the most important factors for the successful implementation of KM efforts (Davenport and Prusak, 1998; Gold, Malhotra and Segars, 2001; Lee and Choi, 2003; Martin, 2000; Roman-Velazquez, 2004).

Organisational culture is one of the most powerful influences on behaviour, and it can enable or hinder knowledge management (Cummings and Worley, 2005; Iftikhar, 2003). The difficulty in shaping organisational culture to align with knowledge management goals is a key inhibitor of effective KM implementation (Gold et al., 2001; Lee and Choi, 2003). Similarly, Kalkan (2008:394) stressed that an inappropriate corporate culture is generally regarded as the key inhibitor of effective knowledge sharing. Denizhan Kalkan (2008) proposed that organisations have to move towards a knowledge-oriented culture in order for their knowledge management initiatives to succeed. Furthermore, Kalkan argued that a knowledge-oriented culture challenges people to share information throughout the organisation and that it is the duty of top management to develop an organisational culture rooted in confidence and trust

where employees feel a valuable part of the organisation. Organisational culture is affected by internal factors, such as the vision, mission, and values of the organisation, the technology employed within the organisation, the organisational structure, and the management style, as well as external factors such as the social environment of the organisation (Lemon and Sahota, 2004). While McDermott and ODell (2001) concluded that culture is a key barrier to knowledge sharing. Turban and Aronson (2001:355) observed that, “the ability of an organisation to learn, develop memory, and share knowledge is dependent on culture”. Therefore “the manner in which people within an organisation relate to each other, especially in a group and a team situation, is important in the KM process” (Coakes et al., 2004:120).

Various studies on the relationship between organisational culture and knowledge management have submitted that organisational culture significantly has an impact on knowledge management (Shafei, et al., 2011; Anderson, 2009; Lawson, 2003; Kangas, 2009). In Jamaica, Lawson (2003) explored the correlation between KM and organisational culture (market culture and adhocracy culture). The study found a significant and positive correlation between KM and the dimensions of organisational culture studied. The most significant correlation was found between adhocracy culture and knowledge management, while the least correlation was found between market culture and knowledge management.

Organisational culture has been gradually recognised as a crucial aspect for successful organisational changes in the implementation of KM. For KM projects to be successful, organisational culture adapted towards knowledge that is the organisation must have knowledge-friendly culture (Chong and Choi, 2005). Otherwise, the absence of an organisational culture that supports, inspires, and rewards the knowledge creation, sharing, and use becomes the major hinderances to an effective knowledge management (Singh and Kant, 2008). Kangas (2009) assessed the association between organisational culture types and knowledge management initiatives. The study verified positive and significant associations between organisational culture and knowledge management. Cruz and Ferreira (2016) similarly in their study on perception of organisational culture and knowledge management in hospitals submitted that a substantial difference was found in knowledge management practices according to the type of organisational culture in all management nodes under analysis.

In the United States, Ghosh and Scott (2007) examined “the integration of clinical KM systems and how it impacts nurses’ collaboration methods during the acquisition, application, and

dissemination of knowledge”. They verified that the interaction between patient and nurse frequently resulted in the creation of new knowledge by the nurse because of identifying symptoms, change in patient condition, and other critical patient care issues. Ghosh and Scott (2007) found that organisational culture played a more important role. In conclusion, they submitted that, “cultural factors, such as levels of participation, encouragement to explore, learning and discussing work with others were key drivers of knowledge sharing processes in organisations. Knowledge infrastructure capabilities, which encompass structure, culture, and technologies, can enhance nurse-nurse interaction. Therefore, for successful implementations of KM systems in healthcare organisations, the systems should be designed to increase the amount of personalisation information captured; provide real-time communications among nurses; and support knowledge creation activities”. (Ghosh and Scott, 2007:81).

Allen (2013) in a PhD study entitled “The Influence of Organisational Culture on Affinity for Knowledge Management Practices of Registered Nurses” used a survey methodology to explore the types of organisational culture available in order to predict the relationship between organisational culture and affinity for KM of nurses working in Oregon hospitals in USA. Ninety-three nurses completed the survey instrument and findings from the data analysis suggested that a positive association exists between organisational culture and affinity for KM. Yaghoubi and Bahadori (2014) carried out a study to investigate the relationship between organisational learning capacity and knowledge management among nurses in Iran. The study used a cross-sectional descriptive-analytical method to collect data from 154 nurses in five hospitals. The findings reveal that the hospitals can store knowledge in databases, but application of knowledge was poor. The study showed that the hospitals needed to create a learning environment, and that leadership impacts the creation and dissemination of knowledge.

According to Sovie (1993), having a flexible organisational culture is an important aspect of organisational management that will empower hospitals for successful healthcare outcomes. Organisational leaders must help their organisation respond to dynamic changes. In agreement, Heskett and Kotter (1992) carried out a study on culture in a healthcare institution. Findings revealed that the culture of healthcare institution can directly affect its capacity in the management of human capital and patient outcomes and ultimately has a strong influence on its performance. Scott et al (2003) argued that healthcare settings have different organisational

characteristics with differing patient care; therefore, abrading the relationship among these settings may be problematic. Moreover, there have not been much studies focused on organisational culture for nurses in the hospital setting.

3.7 Knowledge Process Capability

Knowledge process capabilities represent the fundamental processes for the knowledge assets input in the organisation (Tanriverdi, 2005). Knowledge process capability is essential to leverage the knowledge management infrastructure capability (Grant, 1996; Khalifa and Liu, 2003). Nonaka and Takeuchi (1995) posited that a process capability in KM is the organisation's ability to create new knowledge through the conversion of tacit knowledge to explicit knowledge and ultimate conversion to organisational knowledge. The various perspective of KM presented by different researchers is presented in table 3.2 below.

Table 3.2: Perspectives of KM Process

Author	KM Process
Nonaka and Takeuchi (1995)	accumulate, store, share, use
Leonard (1995)	acquire, collaborate, integrate, experiment
Delong (1997)	capture, transfer, and use
Teece (1998)	create, transfer, assemble, integrate, and exploit
Alavi and Leidner (2001)	creation, storage, transfer, and application
Gold, Malhotra and Segars (2001)	acquisition, conversion, application, protection
Grover and Davenport (2001)	generation, codification, transfer, and realisation.
Bukowitz and Williams (2003)	get, use, learn, contribute, assess, build/sustain divest
Tanriverdi (2005)	creation, transfer, integration, and leverage
Cui et al., (2005)	Acquisition, conversion, application.
Turner and Makhija (2006)	acquisition, transfer, interpretation, and application

King (2009)	acquisition, creation, refinement, storage, transfer, sharing, utilisation
Zheng, Yang and McLean (2010)	Generation, sharing and utilisation
Buheji (2013)	knowledge identification, elicitation, dissemination, and utilization

Gold et al. (2001) categorised the different perspectives of knowledge management process into four broad aspects of acquisition, conversion, application, and protection processes. These four broad aspects have been used in different studies such as that of Khalifa and Liu (2003), Manovas (2004), and Smith (2006). This study also adapts the dimensions of KM process by Gold et al. (2001). The next subsections discuss the dimensions.

3.7.1 Knowledge Acquisition Process

According to Gold et al. (2001:190), “acquisition-oriented KM processes are those oriented toward obtaining knowledge which can be described by many other terms such as acquire, seek, generate, create, capture, and collaborate, all with a common theme – the accumulation of knowledge”. The techniques used by an organisation to acquire and create knowledge depend mainly on the objectives and goals of the organisation. Organisation’s efforts at knowledge acquisition and creation should therefore be guided by its core strategy (Morse, 2000).

Acquisition of knowledge in organisations is affected by integration of various factors such as rules and regulations, systems of relationships and norms that influence the type of information the organisation accepts and transform to organisational knowledge (Raisinghani and Meade, 2005). Raisinghani and Meade (2005) further stressed that an organisation’s knowledge creation is generative in nature. This involves the active construction of knowledge from pre-existing information obtained from the organisational environment and implies that organisations acquire and create knowledge to guide their actions through social and collaborative encounters. Therefore, an organisation wishing to exploit, and leverage needed knowledge for improved performance must have the ability to acquire new knowledge, convert the knowledge, disseminate and interpret the knowledge to proper departments, combine it with the existing knowledge and apply to achieve better performance (Cohen and Levinthal, 1990).

Gold et al. (2001) in the discussion of knowledge acquisition processes highlighted benchmarking and collaboration as two important features. An organisation identifies excellent practices from itself and other organisations through benchmarking and evaluating the existing state of the organisational processes in order to identify problems and challenges and then capture the knowledge for internal use (O'Dell and Grayson, 1998). Collaboration involves teamwork and partnership among members within the organisation or outside the organisation including the network of business partners which serves as sources of knowledge accumulation (Inkpen, 1996; Inkpen and Beamish, 1997; Inkpen and Dinur, 1998).

According to Suresh (2014), the method of acquiring knowledge in nursing may be classified under two broad categories; (1) unstructured methods such as tradition, authority, intuition, experience, and trial and error and; (2) structured methods such as logical reasoning, assembled information, problem solving, and scientific methods/research. Elaborating on knowledge acquisition in nursing care, Ghosh and Scott, (2007:76) explained that,

“For the nursing functions, the key KM transaction is between the nurse and the patient. Knowledge is created during the interaction between the patient and the nurse and may be stored in the KM system by the nurse. The knowledge is then available to other nurses’ future patient interaction scenarios”.

Knowledge acquisition involves grasping and putting together disparate facts and details about patient behaviour. Through empathy, knowledge is gained about the patients felt experience and therefore has a larger repertoire of choices in designing and providing nursing care that is effective and satisfying (Moyer and Wittman-Price, 2007). Knowledge is also acquired through observing, experiencing, imitating, and interacting with other healthcare professionals to facilitate the process of care.

Furthermore, knowledge is acquired by clinical nurses through different of learning activities within an organisation, such as training, formal education, and independent learning. Individuals may depend on a variety of learning channels to acquire explicit and tacit knowledge (Reio and Wiswell, 2000).

3.7.2 Knowledge Conversion Process

Gold, Malhotra, and Segars (2001:191) described the “knowledge conversion process as making existing knowledge useful. They further asserted that some of the processes that allow knowledge conversion include the firm’s ability to organise (Davenport and Klahr, 1998; O’Dell and Grayson, 1998), integrate (Porter-Liebskind, 1996), structure (Moore, 1996), coordinate (Sanchez and Mahoney, 1996), or distribute knowledge (Davenport et al., 1996; Davenport et al., 1998; Zander and Kogut, 1995). The input consisting of raw data, information, organisational knowledge, customer knowledge, and other embedded knowledge in repositories are transformed to outputs consisting of intellectual capital, improved individual and organisational knowledge which are transformed back into inputs (Anderson, 2009).

Nonaka (1994) stressed that creation of new knowledge occurs from the conversion of tacit knowledge to explicit knowledge. Four nodes of knowledge conversion processes were proposed: socialisation, externalisation, combination, and internalisation. “Socialisation encompasses the process of creating tacit knowledge through tacit experience by interaction between individuals. Combination involves “the use of social processes to combine different bodies of explicit knowledge held by individuals. Individuals exchange and combine knowledge through such exchange mechanisms as meetings and telephone conversations therefore the reconfiguring and contextualising of explicit knowledge can lead to new knowledge” (Nonaka, 1994:19). During externalisation process, tacit knowledge is transformed to explicit knowledge by intellectualising and articulation (Nonaka, 1994; Nonaka, von Krogh and Voelpel, 2006). The last mode of knowledge conversion is internalisation, that is, “the conversion of explicit to tacit knowledge which bears some similarity to the traditional notion of learning” (Nonaka, 1994:20). During internalisation processes, an individual retains knowledge held by others and gets converted into activities and practices (Sabherwal and Becerra-Fernandez, 2003).

However, according to Gold et al. (2001:195) “an organisation should not overly focus on the conversion process from data and information to knowledge and neglect the process of conversion from knowledge to information and information to data. The conversions among data, information, and knowledge are cyclical and transitory”. Organisations should convert ineffective knowledge into information and store it in knowledge repositories or simply remove it from the system (Cho, 2011).

Turning to health practitioners, the conversion of tacit and explicit knowledge based on Nonaka's (1994) model has been shown useful in the field of patient safety and informs decision making throughout the nursing process. Chang et al. (2012:1800) submitted that, "the sharing of tacit knowledge among registered nurses, supported by trust and mutual understanding, contributed to patient safety by improving problem-solving, knowledge acquisition, and the detection of medical errors".

3.7.3 Knowledge Application Process

According to Gold et al. (2001:192), the knowledge application process

"refers to the processes that are oriented toward the actual use of knowledge. The basic goals of knowledge management practice are not just generating new knowledge but also assuring that new and existing knowledge is actually applied in all processes where the knowledge can be used throughout an organisation".

Knowledge as a process cannot be disconnected from its respective action-application. This means that knowledge without application is considered information, as supported by the definitions of knowledge: knowledge is information applied to solve a problem (Zack, 1999b; Hinds and Aronson, 2002). Gold et al. (2001) submitted that prior KM literature has paid little attention to the outcomes of effective knowledge application. In agreement, Anderson (2009) noted that an extensive review of the literature finds harmony with Gold et al. (2001)'s submission.

Knowledge management processes such as creation, retrieval and dissemination do not automatically improve the performance of an organisation, and effective knowledge application does (Davenport and Klahr, 1998). In healthcare, nurses apply knowledge to practice using nursing processes and required procedures. The quality of patient care reflects nurses' application of knowledge. Nursing care is provided in practice in direct interaction with patients, and knowledge is created in these interactions, applying scientific knowledge in clinical practice especially procedures and guidelines (Kelley, Brandon and Docherty, 2011). Information is considered knowledge when it is applied to solve problems. However, other KM processes are integrated with knowledge application process to ensure effective action (Anderson, 2009).

3.7.4 Knowledge Protection Process

“Security-oriented knowledge management processes are those designed to protect the knowledge within an organization from illegal or inappropriate use or theft. For a firm to generate and preserve a competitive advantage, it is vital that its knowledge be protected” (Gold et al., 2001: 192).

Knowledge is deprived of its key qualities of rareness and inimitability that makes it a source of competitive advantage without proper security (Anderson, 2009). To avoid unauthorised knowledge outflow, organisations must know how their knowledge is used and stored by their business partners and be aware of who has access to it (Cho, 2011).

Due to the sensitive nature of healthcare data and the increasing risks of information security it is important for healthcare providers to have a robust and consistent information security in place. In nursing practice, nursing documentation is an imperative part of clinical documentation (Mahler et al., 2007); and a source of knowledge patient records and provides evidence indicating how decisions are taken by the nurse and the outcomes of decisions are recorded which needs to be secured (Jefferies, Johnson and Griffiths, 2010). Electronic health record is being used by the nurses primarily for the purposes of planning patient care, documenting the delivery of care, and assessing the outcomes of care. Electronic documentation for nurses is highly relevant because this is where they acquire most of the necessary patient information (Kelley, Brandon and Docherty, 2011). In this regard, information security management is important by protecting the system from malicious access, use, modification, destruction, or disclosure. As well as ensuring privacy through controlling access to intended information (Van der Linden et al., 2009).

Protection of knowledge is highly vital for performance and effective control of knowledge leakage in the organisation. Information technology systems allows proper security by giving users the right of their usage through file name, username, passwords and shared protocols (Matin and Sabagh, 2015). Gold et al. (2001) highlighted that effective storage and retrieval mechanisms enable the organisation to quickly access knowledge. To remain competitive, organisations must create, capture, and locate organisational knowledge. Cho (2011) citing Desouza and Vanapalli (2005) are of the opinion that, organisations must also ensure partner

organisations have suitable security protocols in place, apart from securing their own knowledge resources.

Disregarding knowledge protection can result in the replication of ideas by external organisations and thus, obstruct the exploitation of innovations (Cheung et al., 2012). Resultant effects of knowledge leakage include reputational damage, loss of revenue and productivity (Ahmad et al., 2014). Hence, finding a balance between protecting and sharing knowledge is vital (Norman, 2002). An extensive review of the literature revealed that in the field of knowledge management, little discussion exists regarding the significance of knowledge protection (Anderson, 2009) yet, knowledge protection is an important challenge in healthcare information systems (Hsu, Lee and Su, 2013).

3.8 Nursing care Performance: Effectiveness of Knowledge Management

Registered nurses comprise the largest group of professional healthcare workers and play a vital role in healthcare globally. As a result, the performance of registered nurses is connected to the efficiency and quality of the care provided by the organisations (Awases, Bezuidenhout and Roos, 2013). In healthcare organisations, the nursing performance outcomes are confirmed by the quality of nursing care delivered patients which is mainly measured according to patient outcomes and the achievement of organisational goals (Morrison et al., 1997). Recently, competition among healthcare organisations has become fierce, and this competition has resulted in renewed efforts to improve performance in nursing care delivery. To attain a high quality of patient care, nurses must have the capability to fulfil their professional roles based on evidence-based knowledge and patient needs (Lee, Kim and Kim, 2014).

Nursing care performance reflects the ability of the professional nurses in health institutions to fulfil the organisation's vision and goals; and deliver effective and efficient quality care. According to World Health Organisation (WHO) health report (2006), performance is one of the most important issues deliberated in management research and emphasised as a critical aspect for checking nursing care outcomes in health organisations. It is a combination of staff being available, competent, productive, and responsive.

In nursing care delivery, performance can be studied along the different domain of activities, and across the dimensions of effectiveness, accessibility, and efficiency. The quality and safety of care is associated with various factors within systems, organisations, and their work

environments-the combination of which influences the type of quality and safety of care provided by nurses (IOM, 2004). Dubois et al. (2013) pointed out that nursing performance can be measured based on those aspects associated with the organisational processes involved in nursing care provision. To achieve effective and efficient care, nursing leaders must make accurate and comprehensive evaluations of what they do, demonstrate the knowledge level of the nurses and outcomes of their service in agreement with objectives and goals of the hospital (Gregg, 2002).

Kurtzman and Kizer (2005) observed that no consensus had been met on what to be measured, and how nursing services should be appraised despite the numerous studies that had been carried out in investigating nursing care and patient outcomes. Similarly, Adair et al. (2006) and Harris et al. (2009) reported that there is no consensus of the definition, organisation, and operationalisation of the dimensions of nursing care performance. They further pointed that studies on the measurement of nursing care performance is still emergent. Dubois et al. (2013) stressed that the ambiguity of performance measurement may be due to the many fragmented pieces of knowledge which can be categorised by a variety of terms and concepts that include productivity, outcomes, effectiveness, efficiency, and quality.

The renewed interest in the performance of nursing services has resulted in an accelerated expansion of a range of initiatives within and outside nursing profession to make clear those characteristics of care outcomes that directly contribute to nursing practice (Ajanaku 2018). Different researchers have proposed various indicators for the evaluation of performance in nursing care. For example, Institute of Medicine (2004) considered six domains for the healthcare system which are safety, effectiveness, patient-centeredness, timeliness, efficiency, and quality of care. Moreover, various health care measures have been identified over the years as indicators of health care quality (Institute of Medicine, 1999, 2001, 2005; Joint Commission, 2007; Loeb, 2004).

In a modern healthcare organisation, the outcomes of nursing performance are determined by the quality of nursing care for patients, which are mainly measured according to patient outcomes and the achievement of organisational goals. Recently, competition among healthcare organisations has become fierce, and this competition has resulted in strong efforts to enhance nursing performance. The application and use of knowledge is successful when a confident level of performance is achieved (Cavaleri, 2004). Therefore, performance is the true

test of knowledge especially in the face of unanticipated uncertainties and challenges (Kalling, 2003). KM outcomes should be measured according to organisations objectives through investigating the effectiveness of KM activities in producing valid knowledge that contribute to the realisation of these objectives.

Existing literature cites several factors affecting professional nurses' performance and productivity. These include organisational culture (Tzeng et al. 2002, Park and Kim 2009); professionalism (Awases et al., 2013); leadership (Bae, 2007; Ryu, 2009; Brady and Cummings, 2010); work satisfaction (Bae, 2007); empowerment (Ryu, 2009); and KM (Choi, 2005, Lee, Kim and Kim, 2014). However, the research into KM for nursing in healthcare organisations is in its early stages, there is a dearth of studies that examine the connection between KM capabilities and nursing performance. Therefore, main objective of this research was to draw on the recent notions of KM to help measure its effectiveness on nursing care. From this premise, the indices applied in previous studies such as that of Ghosh and Scott (2006) is utilised in this study. The measurement indices address effectiveness, efficiency, safety, timeliness, patient-centeredness, and equity of care.

3.9 Leveraging KM Capabilities to support Nursing care

Knowledge workers can either intensify knowledge in a precise area or influence existing and under-exploited knowledge resources (Zack, 1999). Applying and using knowledge throughout the organisation; developing knowledge based on existing expertise; and developing completely new expertise by probing new technologies are all strategies that organisations can use to leverage existing internal knowledge resources" (Von Krogh, Nonaka and Aben, 2001:427). Organisations need to examine various KM initiatives for the implementation of KM. These KM initiatives should result in the development of KM programmes and success factors highlighted by various researchers could be used as guidelines for execution (Earl, 2001).

Ansari, Youshanlouei, and Mood (2012:213) asserted that, "KM is not a one-day activity; it needs a harmonic plan composed of a limited set of regions (critical factors) to result in a successful performance". The lack of these critical success factors becomes a barrier and it leads to failure of KM initiatives. Therefore, it is important for organisations to study these factors so that they can identify factors that will be barriers and deal with them beforehand

(Gichoya, 2005). Storey and Barnett (2000) as cited by Wong and Aspinwall (2004:93) stated that for KM initiatives to work in organisations, factors like the information technology support, change in organisational culture are critical.

Since the objective of this research is to examine KM capabilities on nursing care, this section sets out to identify critical success factors that should be considered by healthcare organisations to leverage and support KM in nursing care delivery. Success factors of KM are the critical areas that need the extensive attention and support to achieve an organisation's objectives (Alazmi and Zairi, 2003; Jennex, Smolnik and Croasdell, 2009; Downes, 2014). Several studies have identified various perspectives of critical success factors pertinent to leveraging knowledge resources for the success of knowledge management. Apart from information technology, organisational structure, organisational culture, and KM processes discussed in sections 3.7 and 3.8 above, the other identified success factors are implementation of knowledge management policy, leadership support, knowledge strategy, and motivational incentives.

3.9.1 Implementation of knowledge management policy

Policies give structure to decisions and enable informed decisions to be made about situations that have formerly been previously experienced in healthcare organisations enabling health practitioners, patients, clients and other employees to respond swiftly. Policies built on the goals and objective of the organisation serves as a guide that enables informed decisions to be made and actions to be taken (Althaus, Brigman and Davis, 2007). An organisation's approach to KM policy should be reflected in its culture, commitment to knowledge services, skills and use of IT (Walton and Booth, 2004).

In recent years, healthcare information system is being implemented by large hospitals such as electronic medical record system and personal healthcare records that are deployed, transforming the customary patient paper-based record system. Healthcare organisations should ensure that information systems policies are designed to enable KM, which supports healthcare professionals with information about, critical analysis of, and learning oriented dissemination of health-related information about groups and individuals (Booth et al., 2004).

The implementation of the right KM for informed clinical decision making greatly impacts the quality of healthcare delivery (Shahmoradi, Safadari and Jimma, 2017). KM policy is critical

to address the KM forms, strategies and practices that must be adopted (Boateng, 2010). Dewah and Mutula (2016) affirmed that it is critical to articulate knowledge management policies to enhance efficiency and service delivery in public organisations.

3.9.2 Leadership support

Leadership support is important in delivering and communicating the mission and goals of the organisation, developing an organisational culture that buttress the mission and goals, encouraging and inspiring knowledge sharing and acquisition, and inspiring employees to accomplish KM objectives (Chong and Choi, 2005; Jennex, Smolnik and Croasdell, 2009; Vitari et al., 2007). Leadership support includes educating the employees about the importance of KM practices in ensuring organisational success, setting KM goals and objectives, explicating the types of knowledge important to the organisation, and ensuring funding and other resources are available (Davenport, De Long and Beers, 1998; Wiig, 1999). The organisations' leaders should show a readiness to share and offer their knowledge freely, encouraging processes that will promote cross-boundary learning and sharing and helping to set up knowledge networks of people (Mårtensson, 2000).

Laschinger and Wong (2008) citing Clifford (1998) stated that nurse leaders play an important role in the provision of infrastructure and resources for improving the practices of nurses and ensuring high-quality care is delivered. This involves ensuring that nurse managers have reasonable spans of control that allow them sufficient contact with nurses in the setting and time to complete their duties (Canadian Nursing Advisory Committee (CNAC), 2002; Ontario Ministry of Health Report of the Nursing Task Force, 1999). Liebowitz et al. (2007) noted that leadership impacts the creation and dissemination of knowledge. Similarly, Yaghoubi and Bahadori (2014) found that managerial commitment has a significant relationship with KM. The role of leadership was stressed by Nonaka et al. (2000), that leaders provide the knowledge vision, develop and promote sharing of knowledge assets, create, enable and promote the continuous spiral of knowledge creation. The exploration and exploitation of knowledge is a managerial activity (Zack, 1999) that must over time lead to organisational growth and profitability.

An investigation by Hinno (2012) into leadership support and registered nurses practice environment in hospital settings in Estonia, Finland, and the Netherlands revealed that a

supportive leadership was a necessary characteristic in the practice environment of the registered nurses across the data sets. Hinno (2012) noted that there must be a continuous leadership support and reinforcement of KM systems, with technology resources to implement KM. Furthermore, the top management has the responsibility of shaping the culture of the organisation and implementing IT systems (Bartczak, 2002; Semmel, 2002).

Lashinger and Wong (2008) reported that the use of transformational leadership behaviours at work was associated with greater perceptions of access to empowering work conditions across all three levels of management. At the middle and first-line manager level, it was linked to higher levels of perceived organisational support, influence over staff and policy decisions, job satisfaction, and support for professional practice, high quality of care on their units, communication satisfaction, and coordination within and among units. Middle and first-line managers who perceived their senior nurse leader as demonstrating high levels of transformational leadership behaviours reported higher levels of perceived organisational support, empowerment, communication satisfaction, job satisfaction, influence over human resource and policy decisions, decision latitude, support for professional practice, confidence in patient ability to manage care at discharge, coordination within and among units, and were less likely to leave the organisation. Leadership support influences the productivity of nurses and reduces work constraints in order for nurses to use their knowledge to deliver quality patient care. The provision of supportive opportunities and removal of barriers allows nurses to make informed decisions and enables them to express assurance in these decisions and exploit their scope of practice (Anderson, 2009). The knowledge of nurses, their patient and institutional commitment need to be well organised by the hospitals as the safety, efficiency and effectiveness of patient care and high-quality care is being pursued (Needleman and Hassmiller, 2009).

3.9.3 Knowledge Management Strategies

Essentially knowledge management strategy is the method an organisation employs for connecting its knowledge resources and capabilities to the intellectual requirement needed to accomplish the strategy. It involves the generation of all forms of knowledge and transfer of knowledge to the right person and at the right time within an organisation (Zack, 1999). KM strategy determines the needs, means, and the activities for the objective's accomplishment which is the approach an organisation employs to bring its knowledge resources and

capabilities to the rational requirements of its strategy. Hsieh (2007) citing Bierly and Chakrabarti (1996) pointed that the right strategic decision for a firm is to find equilibrium of both internal and external knowledge resources that best addresses the needs of the organisation.

Zack's (2003) position on knowledge strategy is that the development of strategic dimensions occurs from various interactions of the organisation's knowledge-based resources and capabilities with the organisational strategy results in achieving sustained performance and completeness. This position assumes that the integration of knowledge-based resources and organisational strategy is crucial in its performance outcomes. The mutual relationship between knowledge and strategy is the foundation on which all KM efforts are built on (Kruger, 2008). Snyman and Kruger (2004:15) argued that, "the successful management of an organisation's resources in the next century will be determined to a greater extent by the organisation's ability to combine knowledge management with a thorough understanding of principles involved in business strategy formulation to guide the development of information resources for the firm. Only when combined with direction setting (setting a vision, architecture and a technology plan) and excellent management of the intellectual assets, can an organisation perform most effectively". This statement is synonymous with the line of reasoning followed by authors such as Bate (1999:38), who stated that, "a knowledge management strategy needs to ensure that the destination is consistent with corporate ambitions, that the techniques, technologies, resources, roles, skills, culture etc. are aligned with business objectives".

The implementation of a KM strategy requires "an organisational strategy that is based on contributions by various members of the organisation" (Yeh et al., 2006:795). Deriving from the organisation's strategy are the "various organisational policies and programmes. These policies and programmes must be aligned with each other and should be mutually supportive of an organisation's KM strategy" (McElroy, 2003:60). The implementation of a KM strategy requires adequate support and dedication from top management as it is an important influence on how resources and time are allocated for executing the KM plan (Yeh et al., 2006). Skyrme (1999:33) observed that an "effective KM strategy requires: (1) long-term commitment from all organisational members; (2) the ability to be receptive to changes in both the internal and the external organisational environment; and (3) leadership that demonstrates an enthusiasm for improvement". Furthermore, Skyrme (1999) underlined that an effective KM strategy must

utilise the benefits of the technology for enabling knowledge activities and more responsiveness in the organisation for the provision of better services. The KM strategy must clearly outline the value added by engaging in knowledge management programmes and indicate the risks associated with such programmes (Du Plessis, 2007).

3.9.4 Motivational incentives

Motivation of knowledge workers are gradually being realised as one of the critical success factors for KM implementation (Hasanali, 2002). Motivational incentives should be combined with the importance of collaboration, knowledge sharing, and application among members in a team and across the organisation (Yew Wong, 2005). Incentives should focus on knowledge sharing and contribution, teamwork, creativity and innovative solutions, with group-based compensation encouraging high levels of knowledge exchange. The incentive system should include both financial and non-financial aspects and emphasise on sharing of knowledge, innovation and teamwork (Wolfe and Loraas, 2008). Several researchers agree that motivational incentives inspire employees to share their knowledge (APQC, 2001; Davenport and Prusak, 1998; Gammelgaard, 2007; Hauschild, Licht, and Stein, 2001; Stajkovic and Luthans, 2001). Stajkovic and Luthans (2001) confirmed that rewards such as salary increase, and promotion intensify positive reaction for knowledge sharing which results in creation of new innovative knowledge.

3.9.5 Knowledge management measurement

Performance measurement of KM captures the impact of knowledge on financial and non-financial organisational metrics (Allen and Helms, 2002). It ensures that KM objectives are being achieved, tracks KM progress, and determines its benefits and value (Chong and Choi, 2005; Davenport, De Long and Beers, 1998; Jennex, Smolnik and Croasdell, 2009; Mårtensson, 2000). The financial objective of knowledge management is to capitalise on knowledge assets to increase profit, make sure that improvements in activities are actually converted into reduced costs, and enhance the higher price of a larger sales volume without negative side effects (Kalling, 2003). On the contrary, non-financial performance is an intangible evaluation and differs from the examination of traditional financial performance. While the improvement of non-financial performance is also the purpose of knowledge management, such linkage is obscure and difficult to validate empirically due to an extremely

large number of internal and external factors that can affect non-financial performance (Hsieh, 2007).

Measurement demonstrates the effectiveness, value, and worthiness of KM to management and other stakeholders, substantiating the continued support and confidence of top management (Wong 2005). Yu, Kim, and Kim (2004) conducted an exploratory study on the link between knowledge management drivers and performance. Survey questionnaires were mailed to knowledge management team managers of 220 Korean firms with a brief description of the survey and a return envelope. Seventy-four completed survey questionnaires were returned to the researchers, representing a 33.6 percent response rate. Of these, 66 firms completed cases that could be used for analysis. In this study, the researchers adopted the immediate indicators of knowledge management performance, including knowledge quality and user knowledge satisfaction. The results supported the premise that each factor of knowledge management performance is associated with a different set of drivers.

Knowledge resources are an outcome of organisational culture, structure, and strategy, because knowledge is created, made sense of, and utilised in accordance with a set of cultural values and norms, embedded in structural relationships, and reflected in strategic priorities. In turn, organisational knowledge reflective of cultural, structural, and strategic characteristics of the organisation is utilised to help produce new products and services, improve efficiency, and enhance effectiveness (Mahmoudsalehi et al., 2012). Measuring the knowledge aspects will require an operationally useful framework within which a broader range of data concerning the knowledge resources of an organisation may be collected and analysed (Turner and Minonne, 2009). However, assessing the effectiveness of KM in organisations is difficult, due to the inherently intangible characteristics of knowledge assets (Ahn and Chang 2004; Anantatmula, 2007; Kipley, Lewis and Helm, 2008).

3.9.6 Training

Training provides a better understanding of the concept of KM, framing a common language and perception of how knowledge is defined and thought about, creating an awareness of the organisation's need to manage knowledge and to recognise its importance for the organisation's on-going viability. Training equips managers and employees to fulfil their responsibilities and creates effective work behaviors that support KM. It extends their human

capital, thereby adding to the organisation's intellectual capital (Jennex, Smolnik and Croasdell, 2009).

Skills development training should foster creativity, innovation and knowledge sharing, addressing areas such as communication, social networking, peer learning, team building, collaboration, creative thinking, documentation skills and problem solving (Cardoso, Meireles and Peralta, 2012; Chong and Choi, 2005; Wong, 2005). Training as an organisational factor in teaching hospitals specifically aimed at improving the competences of the healthcare professionals is important in improving healthcare delivery. Therefore, people are considered the building block of organisational learning that can be acquired through training (Anderson, 2009).

3.10 Gaps in Literature

This chapter extensively reviewed literature pertaining to the variables and broader issues of the study. The review focused on concept of knowledge, overview of KM, KM in nursing care, KM capabilities, KM infrastructure, and processes, effectiveness of KM in nursing care performance, critical success factors for leveraging KM capabilities to support nursing care, and other empirical studies that have been done relating to knowledge management in nursing care. The reviewed literature showed that majority of the studies on KM capability has been carried out in other sectors compared to the healthcare sector. Similarly, studies on KM are relatively few in the context of nursing care delivery.

The literature revealed lack of studies on knowledge management capabilities in nursing care considering both dimensions infrastructure and processes in a single endeavour. Previous studies of KM in nursing care have hardly investigated how both infrastructure and processes of KM capability interact with each other and how these interactions affect the outcomes of nursing performance. To fill these gaps, the present study investigated the relationship between KM infrastructure and processes; and how this relationship impacts nursing care performance. From the Nigerian context, the literature reviewed a dearth of literature on KM in nursing care. These gaps were addressed by research question one to four.

The existing research on knowledge management in nursing care has employed largely the single use of quantitative or qualitative methods rather than mixed approach that is suited for investigating in-depth research problems. To address this gap, this study employed mixed

methods approach which comprised of both quantitative and qualitative methods of data collection and analysis. Additionally, the reviewed literature showed that existing research lacked philosophical position. However, this study was underpinned by pragmatist paradigm as the philosophical position.

Furthermore, the review of literature revealed that most of the existing studies of KM in nursing care lack theoretical underpinning. This study brings to the forefront the application of organisational capability theory which is grounded in social capital theory, resource-based view and knowledge-based view theory to address the gap. Organisational capability theory was used to address the research questions in a single endeavour.

The review of the literature showed that healthcare institutions need proper strategies for the implementation of knowledge management to enable the creation, application, capturing, and communication of the knowledge of clinical nurses for effective and efficient patient care. Knowledge management in teaching hospitals would be possible if the organisations had KM enablers in place. This was supported by the studies reviewed which showed that nursing knowledge, if properly utilised, can be a source of improved performance. This study therefore brings to the forefront the critical success factors required in leveraging KM to support nursing care. The gap is addressed by research question 4 of the study.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

Fellows and Liu (2003: 4) define research as “a voyage of discovery for which the reason is to discover the truth and to construct reality”. In submission, Bushaway (2003:161) defined research as “the process of undertaking or carrying out original investigation in all its forms: analysis, innovation, experiment, observation, intellectual enquiry, survey, creativity, measurement, development, hypothesis, modeling and evaluating with a view to generating new knowledge or novel comprehension”. Research methodology refers to the ideologies underlying the methods by which research can be carried out (Fellows and Liu, 2003). Creswell (2008) contributed that research methodology offers a general context that describes the philosophical positions and orientation that the research is anchored on. Consequently, the research methodology to a great extent influences the definite selection, position and coordination of research (Yuan, 2011).

The purpose of this study was to investigate the influence of knowledge management capability on nursing care performance in selected teaching hospitals in South-west region of Nigeria. The following main research questions were investigated in the study:

1. What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?
4. How can KM capability be leveraged to support nursing care performance?

This study derives its implication from the growing attention of the importance of knowledge as a strategic resource for the delivery of high-quality nursing care in healthcare sector. The

underlying framework adopted by the researcher is organisational capability model of Gold, Malhotra and Segars (2001:196-198), who assert that:

- “A firm’s predisposition to organizational effectiveness lies in its knowledge management infrastructure and process capabilities.
- The infrastructure capability consists of three key infrastructures: cultural, structural, and technological because together they enable the maximization of social capital.
- The process capability consists of four dimensions of knowledge management activities: knowledge acquisition, knowledge conversion, knowledge application and knowledge protection”.

Chapter four discusses the methodology used for the research. It provides an overview of the research paradigm and the justification for choosing the research paradigm. In the chapter, philosophical assumptions underlying different research approaches were also examined including the selection and justification of the research approach and research design that were followed in the execution of this study. The population of study, sampling size and procedures, data collection instruments and procedures, data analysis techniques, ethical considerations for the research and summary are discussed in this chapter.

4.2 Research paradigm

Research is built on philosophical assumptions which are related to the view of the researcher of what constitute truth and knowledge. Constructing a philosophical position and orientation towards the inquiry is fundamental to a research (Dainty, 2008). Merriman (1998:3) argues that “it is helpful to link research and philosophical traditions to illustrate different research orientations”.

Briefly, a research paradigm is defined as the “the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways” (Guba and Lincoln, 1994:105); the cluster of basic belief and perspectives that a researcher holds in a particular scientific discipline; a system in terms of which people view events (Fellows and Liu, 2003); “a conceptual framework of assumptions to guide researchers and a set of assumptions from which subsequent theory is developed” (Healy and Perry, 2000: 123).

According to Creswell (1998), paradigms can be characterised through their ontology, epistemology, axiology, rhetorical structure, and methodology. Blaikie (2000:8) has described ontology as “claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other”. Epistemology concerns the “very basis of knowledge-whether this is hard, real, and transmittable in a concrete form, or whether it is softer and more subjective, based on personal experience and insight” (Cohen, Manion and Morrison, 2007: 21). Axiology concerns the role of researcher values in the scientific process (Ponterotto, 2005). Rhetoric structure refers to the language used to present the procedures and results of research to one’s intended audience (Ponterotto, 2005). Methodology is “a model which entails theoretical principles as well as framework that provides guidelines about research, done in the context of a particular paradigm” (Lather, 1992:87). In a nutshell methodology “translates the principles of a paradigm into a research language and shows how the world can be explained, handled, approached or studied” (Sarantakos, 1998:32).

A paradigm hence implies “a pattern, structure and framework or system of scientific and academic ideas, values and assumptions and cuts across the deductive and inductive perspective of the way social reality is constructed. They also underline the interpretation of social reality, either from the subjective or objective point of view, be it in the qualitative, quantitative or mixed methodology” (Olsen, Lodwick, and Dunlop, 1992:16).

The next subsections critically examine the three paradigms (positivism, interpretivism, and pragmatic paradigm) to determine their appropriateness for the current research. The present study is underpinned by the pragmatic paradigm.

4.2.1 Positivism paradigm

Positivism may be seen as an “approach to social research that seeks to apply the natural science model of research as the point of departure for investigations of social phenomena and explanations of the social world” (Denscombe, 2008:14). Positivism views that “the only source or knowledge comes from experiences and that there will be no knowledge of any reality beyond experience” (Given, 2008:647). Positivism sees social science as an organised method for combining deductive logic with precise empirical observations of individual behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict

general patterns of human activity (Neuman, 2006). Positivism is concerned with uncovering truth and presenting it by empirical means and explained with logical analysis (Henning, Van Rensburg and Smit, 2004:17).

Downes (2014) noted that positivism seeks facts or causes of social phenomena with passivity of the human behavior, where precision and objectivity is preferred over intuition and experience. The proponents of this paradigm place an emphasis on empirical theory in production of knowledge and believe that reality can be captured by our senses and they are more concerned with fact than with value (Hughes and Sharrock, 2016; Grix, 2004). Bryman (2004) as cited in Acheampong (2014:113-114) provides a summary of the “claims of positivism as:

1. Only phenomena and hence knowledge confirmed by the senses can genuinely be confirmed as knowledge. This is the principle of phenomenalism.
2. The purpose of theory is to develop general hypothesis that can be tested and thereby allow explanations of laws to be assessed. This is the principle of deductivism.
3. Knowledge is arrived at through the gathering of facts that provide the basis for laws. In other words, inquiry should be based upon scientific observation as opposed to philosophical speculation. This is the principle of inductivism.
4. Science must (and presumably can) be conducted in a way that is value free (i.e. objective). In other words, the natural and human sciences share common logical and methodological principles, dealing with facts and not with values.
5. There is a clear distinction between scientific statement and normative statement and a belief that the former is the true domain of the scientist. This last principle is implied by the first because the truth or otherwise of normative statements cannot be confirmed by the senses”.

According to Doyle et al. (2009), supporters of positivist paradigm argue that in the generalization and transfer of new knowledge, quantifiable, objective and applicable, they often develop and test these explanations in experimental studies (Antwi and Hamza, 2015). Rather than defining a clear set of practices, positivism represents a broad tradition of thought that assumes that reality is constant. The case against positivism is also made in terms of its

apparent disregard for socio-cultural perspectives. Positivist scholars argue that the world is concrete and factual, and that a separation is necessary between the researcher and the research object in order to prevent the former's subjective feelings from affecting the research process, which might otherwise bias the study (Turyasingura, 2011).

The study of socio-cultural phenomena requires, to some extent, 'immersion' of the investigator into the setting of the participants (Schein, 1999). Some scholars believe that since positivists believe everything can be measured and calculated, they tend to be inflexible. Positivists see things as they are and tend to disregard unexplained phenomenon (Johnson and Onwuegbuzie, 2004). It is against this backdrop that makes positivist paradigm not adopted for this study. To achieve the objectives of the study, a pragmatic paradigm was more appropriate to enable the collection of both qualitative and quantitative data from the population, which consisted of registered nurses in the selected teaching hospitals. In this study, the researcher collected both qualitative and quantitative data using questionnaires and interviews. This combined method disregards the principle of the positivists' paradigm and it is thus unsuitable for the present study.

4.2.2 Interpretivism paradigm

Interpretivism proposes that reality does not exist outside the observer, but it is 'constructed' by the social ambiance (experience, social background, and other factors) of the observer. Based on this notion, interpretivism is also referred to as constructivism (Denzin and Lincoln, 2000). According to Chowdhury (2014), interpretivist paradigm has its foundation in the philosophical traditions of hermeneutics and phenomenology. Interpretivism views the nature of inquiry as interpretive, and the purpose of inquiry is to understand a particular phenomenon, not to generalise to a population (Farzanfar, 2005). Proponents of the interpretivist paradigm are naturalistic and non-manipulative, unobtrusive, and uncontrolling (Tuli, 2011). Reeves and Hedberg (2003: 32) note that,

“The interpretive paradigm is concerned with understanding the world as it is from subjective experiences of individuals. Reality is constructed in the mind of the individual, rather than it being an externally singular entity; hidden meaning is brought to the surface through deep reflection. Researchers use meaning (versus measurement) oriented methodologies, such as interviewing or participant

observation, that rely on a subjective relationship between the researcher and subjects”.

This paradigm emphasises that social subjects and problems cannot be studied through positivism.

Interpretivism thus focuses on” exploring the complexity of social phenomena with a view of gaining understanding. The purpose of research in interpretivism is understanding and interpreting everyday happenings (events), experiences and social structures – as well as the values people attach to these phenomena” (Rubin and Babbie, 2010:37). Proponents of interpretivism paradigm not only look for the presence or absence of a causal relationship, but also the specific ways in which it is manifested and the context in which it occurs. Observation and interpretation is the heart of interpretive paradigm. Information is collected about events and interpreted to draw inferences from the meaning of the information or by arbitrating the match between the information (Lin, 1998).

Wisker (2008:69) provided three basic principles of interpretivism:

“(1) The social world is constructed and given meaning subjectively by people. Human beings are subjects that have consciousness, or a mind, while human behaviour is affected by knowledge of the social world, which exists only in relation to human beings; (2) the researcher is part of what is observed; and (3) Research is driven by interests”.

Main downfalls associated with interpretivism relate to subjective nature of this approach and great room for bias on behalf of the researcher. Researchers recognise that their own backgrounds shape their interpretation and they position themselves in the research to acknowledge how their interpretation flows from their personal, cultural and historical experiences (Creswell, 2009). Primary data generated in interpretivism studies cannot be generalised since data is heavily impacted by personal viewpoint and values. Therefore, reliability and representativeness of data is undermined to a certain extent as well. Moreover, interpretivism is qualitative research-based. Therefore, the application of this paradigm to the present study is unsuitable.

4.2.3 Pragmatic paradigm

Pragmatism is a paradigmatic schema, which combines the philosophical foundations of positivism and interpretivism. According to Creswell (2013), pragmatism derives from the work of Cherryholmes (1992). Other writers include Rorty (1990), Murphy (1990), and Patton (1990). Pragmatism is a deconstructive paradigm that advocates the use of mixed methods in research, “sidesteps the contentious issues of truth and reality” (Feilzer, 2010:8), and “focuses instead on 'what works' as the truth regarding the research questions under investigation” (Tashakkori and Teddlie, 2003b: 713). As a paradigm, pragmatism places “the research problem” rather than the theory at the central position and the researcher would apply all available approaches to understand the problem and find solutions to it (Creswell, 2003).

Pragmatism philosophy is concentrated on the connection of practice and theory. According to Saunders et al. (2009), pragmatism philosophy entails the researcher stressing practical consequences and values as standards by which the validity of concepts is to be determined. Morgan (2007) and Cherryholmes (1992) cited in Creswell (2013:3), observed that pragmatism provides a philosophical basis for research, and emphasised that:

1. “Pragmatism is not committed to any one system of philosophy and reality. This applies to mixed methods research in that inquirers draw liberally from both quantitative and qualitative assumptions when they engage in their research.
2. Individual researchers have a freedom of choice. In this way, researchers are free to choose the methods, techniques, and procedures of research that best meet their needs and purposes.
3. Pragmatists do not see the world as an absolute unity. In a similar way, mixed methods researchers look to many approaches for collecting and analysing data rather than subscribing to only one way (e.g., quantitative or qualitative).
4. Truth is what works at the time. It is not based in a duality between reality independent of the mind or within the mind. Thus, in mixed methods research, investigators use both quantitative and qualitative data because they work to provide the best understanding of a research problem.

5. The pragmatist researchers look to what and how to research, based on the intended consequences—where they want to go with it.

6. Thus, for the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as different forms of data collection and analysis” (Creswell (2013:3).

Tashakkori and Teddlie (1998:30) contend that, “pragmatism is intuitively appealing, largely because it avoids the researcher engaging in what they see as rather pointless debates about such concepts as truth and reality”. In Table 4.1 below is the summarised comparison of research paradigms in social science research.

Table 4.1: Summarised comparison of research paradigms in social science research

	Interpretivism	Positivism	Pragmatism
Ontology	Things are socially constructed leading to subjective reasoning which may change with multiple realities	Emphasises that researcher is external, objective and independent of that study	Researcher is external, multiple and the view is that chosen to best answer the research question
Epistemology	Toward subjective meanings of social phenomena, looking at details and realities behind it with motivating actions	Things are observed to prove credibility to facts focusing on causality and law generalisations thereby reducing phenomena to simplest elements	Either subjective or objective meanings can provide facts to a research question; focus on practical applications to issues by merging views to help interpret data
Axiology	The research is value bound; such that the researcher is part of what is being studied, not isolated from the studied and will be subjective	The research is value free, hence independent of the data and objective in the analysis of the data	Values play a vital role to interpret results using subjective and objective reasoning
Approach	Qualitative	Quantitative but can still use qualitative	Approach adopted depends on the research matter
Method	Mono-method	Mono-method but can use mixed in certain cases	Mixed or multiple methods

(Source: Ihuah and Eaton, 2013)

4.2.4 Justification of pragmatic paradigm

The researcher found the pragmatic paradigm as appropriate for the study where both qualitative and quantitative methods were used to collect empirical data from registered nurses and nursing directors on information, organisational structure, organisational culture, knowledge process mechanisms, and challenges faced in the KM adoption. A pragmatic paradigm “employs ‘what works,’ using diverse approaches, and valuing both objective and subjective knowledge” (Creswell and Plano Clark, 2011:43). A pragmatic approach integrates the inductive judgement of qualitative methods and the deductive reasoning of the quantitative method to create beneficial and reliable knowledge for both theoretical and practical application (Johnson and Onwuegbuzie, 2004; Feilzer, 2010).

For this study, pragmatism was chosen as the philosophical position as the researcher is of the view that the research questions are the most important basis of epistemology, ontology, and axiology. However, the choice of the pragmatist paradigm was not determined merely by the nature of the problem under investigation. As already emphasised, the pragmatic paradigm provides researchers with the opportunity to deploy different strategies, different worldviews, different assumptions, and different data collection and analysis techniques in a single study. The pragmatic paradigm has been used in related studies such as that of Yuan (2011), in a PhD study entitled “Knowledge management framework for managing sustainability in the Australian infrastructure sector”; and Munyua (2011) in a PhD study entitled “Agricultural knowledge and information systems (AKISs) among small-scale farmers in Kirinyaga district, Kenya”.

4.3 Research Approach

Research approaches “systematically describe the activities to be undertaken in order to achieve the research aims and objectives. Research approaches are plans and the procedures for research that spans the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation” (Creswell, et al., 2003:215). The selection of a research approach is also based on the nature of the research problem being investigated Creswell (2014) identified three approaches to research, which include quantitative, qualitative and mixed methods. Mixed methods approach (mixing both qualitative and quantitative research approaches) was applied for this study.

4.3.1 Quantitative Approach

Quantitative research methods were originated from the natural sciences in the study of natural phenomena. It anchors on collecting numerical data, making observations and measurements of the phenomena which can be subjected to statistical analysis, repeated and replicated by the same or other researchers under similar conditions (Hamilton, 2003).. Creswell (2003:153) is of the view that “quantitative research involves the collection of data so that information can be quantified and subjected to statistical treatment in order to support or refute alternate knowledge claims”. Quantitative research makes use of “questionnaires, surveys, structured observations and experiments to gather data that is revised and tabulated in numbers, which allows the data to be characterised by the use of statistical analysis” (Hittleman and Simon, 1997:31).

Quantitative research is “specific in its surveying and experimentation, as it builds upon existing theories. Quantitative research begins with a problem statement and involves the formation of a hypothesis, a literature review, and a quantitative data analysis” (Sharpe and Koperwas, 2003:29); it can be used in response to relational questions of variables within the research; and the measurement and analysis of causal or correlational relationships between variables (Denzin and Lincoln, 2000). Harwell (2011:149) noted that, “a quantitative method often adopts a deductive approach during the data analysis process”. Quantitative researchers consider it to be of primary importance to state one’s hypotheses and then test those hypotheses with empirical data to see if they are supported (Antwi and Hamza, 2015). The intent of quantitative researchers is to establish, confirm, or validate relationships and to develop generalisations that contribute to theory (Leedy and Ormrod, 2005).

In the view of the necessities of the research, the first phase that was considered in the study encompassed the administration of survey questionnaire among registered nurses. The survey method has been widely applied in KM studies due to the ability of collecting quantitative data from a large number of participants and analysis of a wide range of variables. This approach helps testing hypotheses derived from theory through collecting data related to frequency of occurrence and testing of existence of relationships between variables of interest. Abbas (2015) used a survey questionnaire to study KM strategies and practices in Nigerian agricultural research institutes.

4.3.2 Qualitative Approach

According to Denzin and Lincoln (2011:3):

“Qualitative research is a situated activity that locates the observer in the world. Qualitative research consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them”.

In justification of qualitative research, most authors are of the opinion that decision should emphasise on whether the research is “credible and confirmable” rather than imposing statistical, quantitative ideas of generalisability on qualitative research (Creswell, 2013).

Qualitative research is founded on inductive reasoning rather than deductive reasoning where data is derived from observational elements and interviews that the researcher attempts to explain and focus on specific situations or people, and emphasis is on words rather than numbers (Sprinthall, Schmutte, and Surois, 1991:101; William, 2011).

According to Domegan and Fleming (2007:24), “qualitative research is designed to help researchers understand people, and the social and cultural contexts within which they live; aims to explore and to discover issues about the problem on hand, because very little is known about the problem”. Furthermore, Philip (1998:267) opined that,

“There is usually uncertainty about dimensions and characteristics of problems and aims to explore and to discover the complexities and differences of worlds-under-study to be explored and represented. The strong correlation between the observer and the data is a marked difference from quantitative research, where the researcher is strictly outside of the phenomena being investigated.”

Qualitative research involves an interpretive, naturalistic approach to the world. This means, “qualitative researchers study things in their natural settings, attempting to make sense of, or

interpret phenomena in terms of the meanings people bring to them” (Denzin and Lincoln, 2005:3).

This research utilised qualitative approach to explore further the important issues that were identified such as :- (i) problems associated with the use of information technology; (ii) the constraints of organizational structure on effective knowledge management practices in nursing care; (iii) barriers created by the organizational culture in providing efficient nursing care; (iv) problems associated with knowledge process strategies in patient care; (v) other challenges of knowledge management in nursing care; and (vi) how to address these issues. Interview method is selected as it allows the researcher to directly converse with the nursing directors in order to gain insights, suggestions, and existing effective practices.

4.3.3 Mixed-method Approach

Mixed research involves “mixing or combining quantitative and qualitative research techniques, methods, approaches, concepts, or language into a single study” (Johnson and Onwuegbuzie, 2004:17). The qualitative and quantitative parts of a research study might be conducted concurrently (conducting both parts at roughly the same time) or sequentially (conducting one part first and the other second) to address a research question or a set of related questions (Wisdom and Creswell, 2013).

Mixed-method researchers in their quantitative and the qualitative views of human behaviour believe that using just quantitative research or qualitative research is restrictive and incomplete for many research problems (Johnson and Christensen, 2008). According to Caracelli and Greene (1997), a mixed methods study involves three distinctive practices: (1) testing the agreement of findings obtained from different measuring instruments; (2) clarifying and building on the results of one method with another method; and (3) demonstrating how the results from one method can impact subsequent methods or inferences drawn from the results. The mixed methods research approach enables the researchers to answer questions about the complex nature of phenomenon from the participants’ point of view and the relationship between measurable variables in a single study (Johnson and Onwuegbuzie, 2004; Tashakkori and Teddlie, 2003).

4.3.4 Justification of the mixed-method approach

As highlighted in Chapter one, the main research objective of this study is to determine the influence of knowledge management capability in nursing care performance in selected teaching hospitals. The choice of the mixed-method approaches in this study was informed by the fact that results from quantitative and qualitative approaches augment each other (Silverman, 2001). A strong argument in support of mixed methods is that the qualitative method covers the aspects not covered by quantitative methods and vice versa in the same research. Creswell (2000:174) highlighted that “the idea of combining quantitative and qualitative approaches in a single study owes much to the past discussions about linking paradigms to methods and combining research designs in all phases of a study”. The selection of mixed methods for this study capitalises on the benefit of both qualitative and quantitative methods, while counteracting both of their disadvantages by combining both quantitative and qualitative techniques. This study benefits from the strength of combined techniques in an inter-related and complementary fashion.

Furthermore, this study builds on the methodologies used in previous KM studies as described above by adopting the mixed-methods approach. This approach provides an appropriate means that must be achieved by the research as defined by the objectives, research objectives, and nature of information to be collected; it also provides methodological flexibility. In nursing research, some scholars have valued the combination of both quantitative and qualitative methods from the perspective of reliability and validity (Morse, 2003; Chi, 1998; Morgan, 2007).

In this study, mixed methods enable the researcher to collect qualitative data through interviews with nursing directors, while quantitative data was collected using questionnaires distributed to the registered nurses in the selected teaching hospitals for a more complete picture of the phenomenon under study. A basic rationale for this design is that one data collection form supplies strength to offset the weaknesses of the other. In line with Creswell and Plano Clark (2011), the researcher utilised an independent level of interaction between the quantitative and qualitative strands of the study- that is the quantitative and qualitative research questions, data collection, and data analysis are kept separate. The two strands were mixed during the overall interpretation of the study. Furthermore, the study utilised a quantitative priority where greater

emphasis is placed on the quantitative methods and the qualitative method is used as a secondary role.

There is paucity of research on the influence of KM capability on nursing care performance in the selected teaching hospitals in Nigeria. It is hoped that the adoption of the quantitative method through questionnaires, together with qualitative method through interviews used will provide valuable insights into the influence of KM capability and validate the KM processes and practices in the nursing care sector in Nigeria. Related studies that have used mixed methods include among others; Abbas (2015), Yuan (2011), and Chigada (2014).

4.4 Research Design

The research design is the blueprint of a study (Babbie and Mouton, 2001). The choice of any research design is influenced by “three conditions: the type of research question posed, the extent of control the investigator has over actual behavioural events and the focus on contemporary as opposed to historical events” (Yin, 2003:1). As outlined by Creswell (2003:3), research design refers to “procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis”. Research design, according to Welman et al. (2010:46) is best described as “the overall plan, according to which the respondents of a proposed study are selected, as well as the means of data collection or generation”. Zikmund (2000) submitted that the research design is a master plan specifying the methods and procedures for collecting and examining the needed information and suggested four basic design techniques for research, namely, surveys, experiments, observation, and secondary data.

A survey is a research plan that comprises asking questions from respondents as a form of measurement. It involves using measurements such as questionnaires and interviews and direct or indirect contact can be made during investigation. Survey design allows the researcher to encapsulate the features of diverse groups and measure their perception towards KM ((Powell and Connaway, 2004). surveys are suitable for studying a large number of cases, even when they are geographically dispersed (Zikmund, 2000).

In the current study, philosophical assumptions and research epistemology was informed by a pragmatist paradigm. Thus, a survey research design was employed along with convergent

mixed methods design to conduct this research. The choice of the survey design was used to achieve the research objectives of the study.

The survey was chosen for the following reasons: surveys allow different types of approaches such as the mixed methods approach; they are well suited to obtaining information about perceptions that are difficult to measure through observational techniques and also allow to obtain demographic data that define the composition of the sample; survey design has ability to provide descriptive and inferential data which can be processed statistically through the use of various statistical tools (Cohen, Manion and Morrison, 2007). Furthermore, this design allows quantitative and qualitative data to be collected and analysed separately, while findings from the two research approaches can be compared to have a clearer understanding of the research problem (Creswell and Plano Clark, 2011). This study adopted a survey design along with convergent mixed methods design to solicit for quantitative data using questionnaires and qualitative data through the use of semi-structured interviews.

Extant literature reveals previous empirical studies on KM used the survey design. Studies such as Allen (2013) in an investigation of the influence of organisational culture on affinity for knowledge management practices of registered nurses; Simon (2016) in study of the relationship between knowledge management tools and inter-professional healthcare team decision making; and Lee, Kim and Kim (2014) in an investigation on the relationships between core knowledge management factors and nursing performance outcomes, all used a survey design.

4.5 Population of study

Babbie and Mouton (2001:173) define a population as “the theoretically specified aggregation of study elements. A population is the entire group of people that the researcher desires to learn about and as all members of any well-defined class of people, events, or objects”. The population of this study consisted of the Registered Nurses (RNs) working in the various clinical wards in the selected teaching hospitals in South-west Nigeria. The population of teaching hospitals consisted two: University College Hospital (UCH) and Obafemi Awolowo University Teaching Hospitals (OAUTHC). The study excluded clinical and non-clinical professionals working in the hospitals. Table 4.2 below shows the population of the RNs in UI/UCH and OAUTHC as obtained from the teaching hospitals respectively.

Table 4.2: Population of Registered Nurses in the Selected Hospitals

S/N	Institutions	Registered Nurses	Deputy Directors of Nursing Services
1	UCH	1192	8
2	OAUTHC	756	6
Total		1948	14

(Source: OAUTHC and UI/UCH Establishment, 2017)

4.6 Sample size

Tashakkori and Teddlie (2010:137) defined sampling as “selecting a set of elements from a population in such a way that descriptions of those elements accurately describe the total population from which they were selected”. Robson (2002:260) highlights that “sampling is a fundamental element of a research project because it guides the study when determining the specific group of aspects to be observed”. The purpose of drawing a sample from a population is to obtain information concerning that population (Abass, 2015). A researcher must first decide the sample size from a population before selection of a sampling technique. Sampling enables the researcher to avoid bias in choosing the sample and accomplish greater accuracy in determining sample size (Kumar, 2005). The aim of sampling is to get a small collection of units from a much larger population.

Due to the nature of research objectives, Krejcie and Morgan’s (1970) table of determining sample size given a finite population, was used to select the sample size for this study. Based on the total sample population of 1948 for UCH and OAUTHC, the sample size of the study is 320 registered nurses according to Krejcie and Morgan (1970) as shown in Table 4.3. OAU and UCH Establishment (2017), was used as the sampling frame.

Table 4.3: Required sample size, given a finite population

Total population	Sample size								
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346

25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380

(Source: Krejcie and Morgan, 1970:608)

In order to determine the proportional sample size for each of the two institutions, Krejcie and Morgan's (1970) formula is used:

$$SP = \frac{N \times S}{TP}$$

TP

Where SP is the sample population, N is population size of the RNs, S is sample size and TP is the total population.

Based on this formula, the distribution of samples across the two teaching hospitals was:

University College Hospital: $\frac{320 \times 1192}{1948}$

1948

= 196

Obafemi Awolowo University Teaching Hospitals Complex: 320×756

1948

= 124

In Table 4.4, a relative population of registered nurses and sample size is provided.

Table 4.4: Relative populations and corresponding sample sizes of the institutions

S/N	Institution	Population of registered nurses	Generation of sample using Krejcie and Morgan, 1970	Sample size
1	UCH	1192	$320 \times 1192/1948$ =195.8	196
2	OAUTHC	756	$320 \times 756/1948$ =124	124
	Total	1948		320

(Source: UCH Establishment, 2017; OAU Establishment, 2017; Krejcie and Morgan, 1970)

4.7 Sampling Procedures

Two common classification of sampling methods exist in literature: probability sampling and non-probability sampling (Etikan, Musa and Alkassim, 2016). Types of probability sampling include simple random sampling, stratified sampling, systematic sampling, and cluster sampling techniques. Non-probability uses convenience, purposive, snow-ball, and judgmental sampling where the sample is selected according to some predetermined criteria. Both probability and non-probability methods were used in this study. Stratified sampling and purposive sampling were employed in the selection of respondents (Omair, 2014).

According to Fink (1995), stratified random sampling is a method of probability sampling that involves the division of the population into ‘subgroups’ known as ‘strata’ and a sample is randomly selected from each ‘strata’ (Fink, 1995). Bryman (2006) identified two types of stratified random sampling as proportionate and disproportionate.

According to Bryman (2006:101):

“In a proportionate stratified sampling, the number of observations in the total sample is allocated among the strata of the population in proportion to the relative number of elements in each stratum of the population. In contrast, a disproportionate stratified sample design is associated with the use of different probabilities of selection, or sampling fractions, within the various population strata”.

Henry (1990) indicated that proportionate stratified sampling is often done to “insure representation of groups that have importance to the research” and disproportionate is “done to allow analysis of some particular strata members or to increase the overall precision of the sample estimates”. Babbie (2009) highlighted that whenever cluster samples are of differing sizes in academic research, it is advisable to use proportionate sampling in order to give each cluster a change of selection proportionate to its size.

Proportionate stratified sampling was used for quantitative data collection (questionnaires). Thus, as highlighted in section 4.6, the sample size was calculated propositional to the population size. The clinical units are: accident and emergency, operating theatre, intensive care, outpatient, surgical, paediatrics, labour, ear, nose and throat, ophthalmology, orthopaedic, virology, antenatal, gynaecology, maternity, medical, mental health and renal units. The population of registered nurses in University College Hospital (UCH) and Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) was stratified according to the clinical units. Based on this, the clinical units were used as a stratum based on the differing medical functions. Proportionate allocation was applied to select the respondents from each stratum.

The same sampling fraction was applied for each stratum regardless of the differences in population size of the strata. In OAUTHC, eight respondents were selected from the clinical units (outpatient, surgical, operating theatre, paediatrics, accident and emergency) while seven respondents were selected from intensive care, labour ward, ear, nose and throat,

ophthalmology, orthopaedic, virology, antenatal, gynaecology, maternity, medical, mental health and renal units. In UCH, twelve respondents were selected from outpatient, surgical, operating theatre, accident and emergency, paediatrics, intensive care, labour, ear, nose and throat (ENT) and ophthalmology. Furthermore, eleven respondents were selected from orthopaedic, virology, antenatal, gynaecology, maternity, medical, mental health and renal units. The goal of proportionate stratification in this study is to ensure that sample sizes for strata are of their expected size and sample chosen is representative of the population. Gravetter and Forzano (2012) underscored that researchers can use the stratified random sample to get suitable samples from all strata in the population.

Purposive sampling method is primarily used in qualitative studies, involves the selection of units and groups based on research objectives (Teddlie and Yu, 2007). Purposive sampling method was employed in selecting the deputy directors of nursing services (DDNS) based on their experience and knowledge of the subject matter. The researcher selected only the DDNS for this study. The selection of the DDNS as respondents for the semi-structured interview was based on the in-depth experience they have of nursing care delivery and are more strategically oriented in managerial processes of the hospitals.

4.8 Data collection procedures

Data collection method is a systematic approach including the techniques and tools used in data collection (Anderson, 2010). Combination of qualitative (semi-structured interview) and quantitative research methods (questionnaire) were utilised. The main method of data collection in this study was closed-ended questionnaires (Appendix 1) which were complemented by semi-structured interviews (Appendix 2). Creswell and Plano Clark (2011) pointed out that the combination of these two instruments will enable the weakness of one method to be moderated by the strengths of the other. The next section discusses the data collection instruments and operationalisation of variables.

4.8.1 Questionnaire

A questionnaire is a “printed document that contains instructions, questions and statements that are compiled to obtain answers from respondents” (Wimmer and Dominick, 2006:130). A self-administered questionnaire was used to collect quantitative data from 320 registered nurses using the sample sizes in Table 4.4 above. The questionnaire was used to solicit the quantitative

data from the registered nurses covering themes of information technology support, organisational structure, organisational culture, knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection. The researcher used survey questionnaires to collect quantitative data to confirm the responses from the qualitative data collected through semi-structured interviews.

The self-administered questionnaire comprises of two sections consisting of quantitative scaled questions which allowed collection of data within a given period and encouraged a high response rate (Sekaran, 2003). The first section is a list of demographic data of the respondents which include age range, highest qualification, health institution, employee type, clinical ward, job title/designation, and years of work experience. The second section comprises the analysis of knowledge management capability which measures the knowledge infrastructure capability, knowledge process capability, and nursing care performance. The analysis of knowledge infrastructure capability comprises a list of questions which measures the three sub-dimensions --culture, structure, and technology. The analysis of knowledge process capability consists of a list of questions that measure the four sub-dimensions—acquisition, conversion, application and protection. The final sub section includes a list of questions that comprises the analysis of nursing care performance.

The items in the questionnaire were anchored on a five-point Likert scale. Pickard (2007:188) defined the likert scale as a “bipolar scaling technique, which allows respondents to select a choice that best demonstrates their level of agreement with a given statement”. The validity of the instrument had been verified in earlier research of Gold et al. (2001), and Ghosh and Scott (2005). A pilot study was recommended by Cavana, Delahaye and Sekeran (2001), Burns and Bush (2003), Malhotra (2003), and Polit, Beck and Hungler (2005) in order to revise the items in the questionnaire before implementing the main survey. Therefore, as discussed in sub section 4.8.5, the instrument was pretested with a small sample of registered nurses in similar teaching hospitals to ensure the questions were clear and understood, as well as to identify problems the respondents may have encountered as suggested by Zikmund (2000).

4.8.2 Operationalisation of Measures

The theoretical model consists of eight constructs which are information technology support, organisational structure, organisational culture (identifies by knowledge infrastructure

capability) and acquisition, conversion, application, and protection processes (identified by knowledge process capability). The constructs identified for this study were adopted from Gold et al. (2001) and Ghosh and Scott (2005) leading to a list of 64 measurement items. Gold et al. (2001:193) highlighted that, “knowledge management lacks a strong empirical base and, therefore, the researcher derived the measures from theoretical statements made in the literature or from assessments within the practitioner literature on knowledge management”. The constructs used multiple-item measures, and each item was based on a five-point Likert scale from 1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree.

Measuring the variables with Likert-type scales facilitates standardising and quantifying the relative effects (Gold et al., 2001). Five-point Likert-type scale was used to increase the response rate and response quality along with reducing respondents’ frustration level (Babakus and Mangold, 1992). Literature suggests that a five-point Likert-type scale appears to be less confusing, increases response rate, is readily comprehensible to respondents, and enables them to express their views (Hayes, 1997). All operational definitions of instruments and their related literature are summarised in Appendix 1. The item measures for each of the constructs are outlined in the next section.

4.8.2.1 Personal data of respondents

This section included information about the gender, age range, highest qualification, health institutions’ name, employee, clinical ward, job title, and years of experience for each of the respondents. Appendix 1 shows the survey items of the personal data of the respondents.

4.8.2.2 Knowledge Infrastructure Capability Item measures

The knowledge infrastructure capability comprises of information technology support, organisational structure, and organisational culture. Each of these components is defined in the following subsections:

Information Technology

The technology component of knowledge infrastructure capability refers to the technology-enabled ties that exist within a firm (Anderson, 2009). “Technology enables and supports core activities such as: knowledge creation, knowledge sharing, knowledge distribution, and

knowledge application” (Cho, 2011:97). Information technology was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The measurement of the variable of information technology support is adopted from Gold, Malhotra and Segar (2001), and Ghosh and Scott (2005). Table 4.5 presents the item measures of the variable.

Table 4.5: Measures of Information Technology Support

Code	Item wording
	“My organisation has IT that allows...
IT1	Collaboration with other clinical staff in the organisation
IT2	Mapping of the location of specific type of knowledge
IT3	Search for new clinical knowledge
IT4	Retrieve and use knowledge about clinical processes and services such as use of electronic medical records, personal digital assistants, computers and tablets
IT5	Generation of new clinical processes in conjunction with other health institutions
IT6	Clear rules for formulating or categorizing its clinical process knowledge
IT7	Monitoring of clinical processes
IT8	Support for communication among the nurses and other clinical staff”.

Organisational Structure

Gold, Malhotra and Segars, (2001:198) defined organisational structure as “the rules, policies, procedures, hierarchy of reporting relationships, incentive systems, and departmental boundaries that organise tasks within the firm”. Gold, Malhotra and Segar (2001), and Ghosh and Scott (2005)’s measure of the organisational structure variable is adopted in the current study. Organisational structure was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.6).

Table 4 6: Measures of Organisational Structure

Item code	Item wording
	“My organisation (‘s)...

OS1	Structure of departments and divisions inhibits interaction and sharing of knowledge
OS2	Structure promotes collective rather than individualistic behaviour
OS3	Encourages employees to go where they need for clinical knowledge
OS4	Managers frequently examine clinical knowledge for errors/mistakes
OS5	Structure facilitates the creation of new knowledge across structural boundaries
OS6	Structure facilitates the discovery of new clinical knowledge
OS7	Designs processes to facilitate knowledge exchange across functional boundaries”

Organisational Culture

Organisational culture is defined as the “underlying values, beliefs, practices of the people in the organisation and principles that serve as a foundation for the organisation’s management system, as well as the set of management practices and behaviors that both exemplify and reinforce those principles” (Denison, 1990:2). The questions used to measure the variable is adopted from Gold, Malhotra and Segar (2001), and Ghosh and Scott (2005). Organisational structure was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.7).

Table 4.7: Measures of Organisational Culture

Item code	Item wording
	“In my organisation...
OC1	Nursing staff understand the importance of knowledge to clinical success
OC2	High levels of participation are expected in capturing and transferring knowledge
OC3	On the job training and learning are valued
OC4	Nursing staff are encouraged to discuss patient care problems with nurses in other departments
OC5	Senior management clearly support the role of knowledge management to nursing care success
OC6	Has adequate support services to allow me to spend time with my patients
OC7	Overall organisational objectives and vision is clearly stated”

4.8.2.3 Knowledge Process Capability Item Measures

The knowledge process capability is comprised of four components: acquisition, conversion, application, and protection. Each of these components is defined in the following subsections.

Knowledge Acquisition Process

Knowledge acquisition refers to the “knowledge management processes oriented toward knowledge accumulation” (Gold et al., 2001:190). The questions used to measure the variable is adopted from Gold, Malhotra and Segar (2001), and Ghosh and Scott (2005). Knowledge acquisition process was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.8).

Table 4.8: Measures of Acquisition Process

Item code	Item wording
	“My organisation...
AP1	Has processes for acquiring knowledge about patients
AP2	Has processes for generating new knowledge from existing knowledge
AP3	Has processes for distributing knowledge throughout the organisation
AP4	Has processes for inter departmental collaboration
AP5	Has processes for acquiring knowledge about new clinical services
AP6	Has processes for benchmarking performance
AP7	Has teams devoted to identifying best practices
AP8	Has processes for exchanging knowledge between nurses and other clinical staff”

Knowledge Conversion Process

Gold et al. (2001:191) refer to the knowledge conversion process as “activities making existing knowledge useful”. The questions used to measure the knowledge conversion process variable is adopted from Gold, Malhotra and Segar (2001), and Ghosh and Scott (2005). Knowledge acquisition process was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.9).

Table 4.9: Measures of Conversion Process

Item code	Item wording
	“My organisation...
CP1	Has processes for converting knowledge into the design of new clinical services
CP2	Has processes for filtering knowledge
CP3	Has processes for transferring organisational knowledge to individuals
CP4	Has processes for distributing knowledge throughout the organisation
CP5	Has processes for integrating different sources and types of knowledge
CP6	Has processes for organizing knowledge
CP7	Has processes for replacing out-dated knowledge
CP8	Has processes for absorbing knowledge from individuals into the organisation”

Knowledge Application Process

The knowledge-application process refers to the “processes that are oriented toward the actual use of the knowledge after it is converted” (Gold et al., 2001:191). Gold et al. (2001), and Ghosh and Scott (2005)’s measure of this variable is adopted in the current study. Knowledge application process was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.10).

Table 4.10: Measures of Application Process

Item code	Item wording
	“My organisation...
APP1	Has processes for applying knowledge learned from experiences
APP2	Has processes for using knowledge in development of new clinical services
APP3	Has processes for using knowledge to solve new problems
APP4	Matches sources of knowledge to patient problems and challenges
APP5	Uses knowledge to improve efficiency
APP6	Is able to locate and apply knowledge to changing clinical conditions
APP7	Makes knowledge accessible to those who need it
APP8	Quickly applies knowledge to critical needs”

Knowledge Protection Process

Knowledge protection processes are “activities aimed at securing knowledge against inappropriate or illegal use or from theft” (Gold et al., 2001:192). Gold et al. (2001) and Ghosh and Scott (2005)’s measure of this variable is adopted in the current study. Knowledge protection process was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.11).

Table 4.11: Measures of Protection Process

Item code	Item wording
	“My organisation...
PP1	Has processes to protect clinical knowledge from inappropriate use inside the organisation
PP2	Has processes to protect clinical knowledge from inappropriate use outside the organisation
PP3	Has technology that restricts access to some sources of knowledge
PP4	Values and protects knowledge embedded in individuals
PP5	Clearly communicate the importance of protecting knowledge
PP6	Has extensive policies and procedures for protecting patient secrets
PP7	Knowledge that is restricted is clearly identified
PP8	Has processes that encourage the protection of knowledge”

4.8.2.4 Nursing Care Performance Item Measures

Nursing care performance in this study refers to the effectiveness and efficiency of knowledge management practices among nurses. The dimensions of the nursing care performance construct of this study are defined by the seven dimensions identified by IOM (2004): safety, timeliness, effectiveness, efficiency, equity, patient-centeredness, and quality of care. Ghosh and Scott (2005)’s measure of this variable is adopted in the current study. Nursing care performance was measured with a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (presented in Table 4.12).

Table 4.12: Measures of Nursing Care Performance

Item code	Item wording
	“My organisation...
NP1	Improves the timeliness and efficiency of patient care
NP2	Improves the overall effectiveness of patient care in terms of my knowledge, skill, experience, and attitude.
NP3	Reduces unnecessary patient transfer or returns
NP4	Responsive to complaints from patients and families
NP5	Improves the service productivity of nursing staff’

4.8.3 Semi-structured interview schedule

Interviews are an important part of any research project “as they provide the opportunity for the researcher to investigate further, to solve problems and to gather data which could not have been obtained in other ways” (Cunningham, 1993:93). The interview is essentially a qualitative data gathering technique that finds the interviewer directing the interaction and inquiry in a very structured or unstructured manner, depending on the interview's purpose (Kumar, 1996). There are three types of interviews namely unstructured, semi-structured and structured (Yuan, 2011).

Unstructured interviews are those conducted to bring some preliminary issues to the surface so that the researcher can determine what variables need further investigation (Yuan, 2011). Semi-structured interviews are designed to have only a number of predetermined questions which are relatively open, while the subsequent interview questions are raised during the interview conduction (Wengraf, 2001). In contrast, structured interviews are those operated with all interview questions and are pre-formulated when the researcher knows clearly what information is needed (Kajornboon, 2005). The semi-structured gives the development of a framework that highlights the in-depth issues to be explored.

David and Sutton (2004:87) concur that, “semi-structured interviews are non-standardised and are frequently used in qualitative analysis”. According to Newton (2010), the interviewer does not do the research to test a specific hypothesis; an interview guide is also used, and additional questions that have not been anticipated in the beginning of the interview can be asked. The flexibility in semi-structured interviews enables the researcher to improve questions to guide

and focus on the sub topics that the interviewee is most knowledgeable about (Yuan, 2011). Furthermore, the semi-structured interview offers a researcher the opportunity to ask interviewees questions and conduct a follow up verbally to elicit deeper responses during the interview session (Bryman, 2004). For this reason, semi-structured interview is more appropriate for this research and was selected to gather qualitative data.

The face to face semi-structured interview format was adopted in the study based on the following reasons: it provides the opportunity to generate rich data; helps gain insight into respondents' perceptions and values; and data generated can be analysed in different ways. The advantage of this format is that in-depth information and details can be secured through this process. The researcher developed an interview guide (Appendix 2) to ensure consistency in the approach to which the semi-structured interviews were conducted. The interview guide provides a list of questions to be explored to ensure that every respondent is interviewed following the same pattern of questions.

Anthony, Perrewé and Kacmar (1999:216) cited in Govender (2012:165) are of the view that interviews are a preferred data collection method when data is required from managerial and professional subjects relating to complicated phenomena. The semi-structured interview guide was used to collect qualitative data from 14 deputy nursing directors. The deputy directors were selected for semi-structured interview because they provide professional leadership to all nursing staff, possess an in-depth understanding of the hospital system and are responsible for the provision of a high-quality nursing service in the delivery of patient care and quality.

The semi-structured interview guide comprises of two sections. The first section contained a list of questions on the demographics of the respondents and the second section consist of a list of questions seeking to explore the perceptions of the respondents on the knowledge management infrastructure, knowledge management process and challenges faced in providing efficient and effective nursing care in the selected teaching hospitals.

The researcher communicated the objectives and the background of the study clearly. The interviews were arranged to coincide with the time that the questionnaires were administered at the teaching hospitals for convenience. Each interview was scheduled for and lasted an average of one hour and was generally conducted in a reasonably relaxed environment. The

responses from the respondents were tape recorded to capture data accurately and notes were taken.

4.8.4 Validity and reliability analysis

The related concepts of validity and reliability are very important in determining the overall quality of a research study. Researchers aim to establish the truthfulness, credibility and believability of their findings through measures that are valid and reliable (Davis, 2004; Lincoln and Guba, 1985; Neuman, 2006). Validity generally refers “to the extent to which a data collection instrument collects data with the attributes that the research intends to measure” (Katebire, 2007:29). Kazi and Khalid (2012) categorized types of validity into three which include content validity, criterion-related validity and construct validity. They submitted that it is necessary for a research questionnaire to undergo validation procedure in order to measure what it is designed to measure. Anthoine et al. (2014) also submitted that validating research questionnaire in health-related research is to prevent biased and unrealistic research results. The researcher utilised the three aspects of validity as pointed by Kazi and Khalid (2012) to validate the questionnaire and interview guide. This assisted the researcher to identify unclear questions, determine if relevant questions are included and also draw comprehensive comments from the respondents.

Reliability is concerned with “consistency, stability and repeatability of the informant’s accounts as well as the investigator’s ability to collect and record information accurately” (Brink et al., 2012:124). It refers to the extent to which the research instrument measures consistently whatever it was designed to measure (Brink and Louw, 2012). Heale and Twycross (2015) highlighted three aspects of ensuring reliability which include; (1) Homogeneity (internal consistency) which is assessed using item-to-total correlation, split-half reliability, Kuder-Richardson coefficient and Cronbach’s alpha; (2) Stability which is tested using test-retest and parallel or alternate form reliability testing; and (3) Equivalence which is assessed through inter-rater reliability.

The reliability in this study was achieved by conducting test-retest reliability and subjecting the results obtained to a Cronbach’s Alpha, to determine the measure of internal consistency and reliability of the instruments (refer to Table 4.13). For effective reliability of interview schedule in academic research, the researcher needs to allow the respondent to understand the

interview questions very well so that the answers can be coded without the possibility of uncertainty (Ani, 2013; Silverman, 2001).

4.8.5 Pilot Study

Pilot study in health research is a feasibility study which may be a trial version in preparation for the real study (Van Teijlingen, and Hundley, 2002). This infers that a pilot study is pre-testing a research instrument. Thus, a pilot study was carried out in this research to test, validate and refine the data collection instruments in order to identify any problems that the respondents might face in understanding the questions and to reduce inaccuracies and inconsistencies in the questionnaire and interview schedules. The measurement scales of the constructs of the questionnaire utilised in this study was adapted from Gold et al. (2001), and Ghosh and Scott (2005). Adapting research instruments is a legitimate way of attaining validity and reliability of the instruments (Creswell, 2009 cited in Ajanaku, 2018). The measurement scales were originally developed in the context of developed countries. The interview schedule contains a list of questions developed from extant literature. Therefore, a pilot study was required to be performed to revise the measures in the context of Nigeria, a developing country in Africa.

Nguyet (2010:109) shared the opinion that “pre-test subjects should be as similar as possible to the final group, representative but with extreme as well as typical respondents, or more succinctly, should mirror the composition of the main survey”. Nasser and Wisenbaker, (2003:754) further submitted that “for covariance-based SEM, it is generally advisable that the sample size should exceed 100 observations regardless of other data characteristics to avoid problematic solutions and obtain acceptable fit concurrently”. Thus, in the pilot study, 150 draft questionnaires were distributed to registered nurses at Ladoke Akintola University of Technology Teaching Hospital (LAUTECHTH) and Adeoyo General Hospital using convenience sampling. The teaching hospitals are similar to that of the two teaching hospitals used for this research.

A sum of 120 questionnaires was returned by the respondents. However, 10 out of the responses had incomplete data and were excluded in the analysis. The data collected from 110 respondents were used to refine the construct measurement scales by examining their validity and reliability. Item-total correlations and principal component analysis (PCA) were applied to check the construct validity, followed by a varimax rotation. The equivalence measure of

reliability of the questionnaire was by testing Cronbach's Alpha (α) coefficient. SPSS software version 22.0 was employed to conduct these analyses.

For the qualitative research instrument, a small number of three pilot interviews were conducted with deputy directors of nursing services after which the responses were carefully analysed by the researcher. This included face validity which was done to ensure content validity that is, validity of questions and the reliability of the data obtained. This also helped to confirm the clarity of questions, identify unclear and ambiguous questions, remove difficult questions, determine if relevant questions were included and gather remarks and comments from the respondents (Saunders, Lewis and Thornhill, 2009). Piloting assisted the researcher to identify which questions on the questionnaire and interview guide required reframing or rephrasing. The questionnaire was improved and modified, based on the feedback obtained.

4.8.6 Results of the Pilot Study

Adapted from Gold et al. (2001), this research examined seven variables: information technology support, organisational structure, organisational culture, acquisition process, conversion process, application process and protection process. The remaining variable, nursing care performance was assessed using a measure adapted from Ghosh and Scott (2005).

The general accepted value of Cronbach alpha coefficient for reliability is 0.70 (Hair et al., 2006; Gefen, Straub, and Boudreau, 2000). The reliabilities and percentage variance extracted for each scale for the selected hospitals was calculated. All the subscales in Table 4.13 had acceptable coefficient Cronbach alpha levels which ranged from 0.79 to 0.92, and item-total correlations above 0.4. Thus, it can be considered reliable and valid. The Cronbach coefficient of 0.70 and above suggests that the questionnaire is highly reliable and can be recommended for use and the variance in the scores is reliable variance (Lance et al., 2006). The result of the pilot study is depicted in Table 4.13 below.

Table 4.13: Result of the Pilot Study

Construct	Cronbach alpha	Item total correlation		PCA		Items deleted
				Component loading	Variance extracted	
Information Technology	0.926	IT1	.744	.773	66.41%	None
		IT2	.751	.780		
		IT3	.779	.798		
		IT4	.637	.667		
		IT5	.707	.732		
		IT6	.811	.851		
		IT7	.832	.870		
		IT8	.739	.798		
				KMO=0.915, P-value= 0.000 Bartlett's Test = 1653.37		
Organisational structure	0.798	OS1	.221	Nil	57.30%	OS1
		OS2	.549	.529		
		OS3	.585	.583		
		OS4	.593	.600		
		OS5	.627	.755		
		OS6	.695	.877		
		OS7	.606	.777		
				KMO= 0.814, P-value=0.000 Bartlett's Test = 805.09		
Organisational culture	0.827	OC1	.544	.643	60.49%	OC5
		OC2	.590	.702		
		OC3	.705	.837		
		OC4	.675	.711		
		OC5	.474	Nil		
		OC6	.645	.657		
		OC7	.574	.618		
				KMO=0.768, P-value= 0.000 Bartlett's Test = 631.72		

Acquisition Process	0.901	AP1	.624	.644	59.62%	None
		AP2	.682	.729		
		AP3	.734	.779		
		AP4	.716	.767		
		AP5	.801	.863		
		AP6	.700	.759		
		AP7	.685	.706		
		AP8	.586	.599		
				KMO=0.907, P-value= 0.000 Bartlett's Test = 1345.87		
Conversion process	0.936	CP1	.805	.836	69.26%	None
		CP2	.757	.786		
		CP3	.796	.830		
		CP4	.771	.807		
		CP5	.767	.800		
		CP6	.793	.823		
		CP7	.761	.783		
		CP8	.756	.777		
				KMO= 0.919, P-value=0.000 Bartlett's Test = 1811.59		
Application process	0.927	APP1	.720	.751	66.64%	None
		APP2	.711	.743		
		APP3	.815	.853		
		APP4	.779	.817		
		APP5	.770	.815		
		APP6	.778	.816		
		APP7	.728	.749		
		APP8	.725	.745		
				KMO=0.930, P-value =0.000 Bartlett's Test = 1567.89		
Protection process	0.883	PP1	.574	.618	55.07%	None

		PP2	.694	.737		
		PP3	.653	.696		
		PP4	.679	.736		
		PP5	.658	.713		
		PP6	.646	.690		
		PP7	.629	.674		
		PP8	.666	.712		
					KMO=0.872, P-value =0.000 Bartlett's Test = 1285.89	
Nursing care performance	0.841	NP1	.608	.676	61.85%	None
		NP2	.660	.733		
		NP3	.699	.800		
		NP4	.683	.747		
		NP5	.602	.657		
						KMO =0.807, P-value=0.000 Bartlett's Test = 599.51

The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test was applied to test factorability of the data. A KMO value closer to 1 is good and 0.6 is acceptable (Brace et al., 2006). The result of the KMO (above 0.70) for all items and the Bartlett's Test of Sphericity were significant at $p=0.000$. The significance level in Table 4.13 is .000. Since these sub-constructs have been tested before by Gold et al. (2001) and are considered established measures, they can be expected to meet the 0.70 alpha threshold.

The principal component analysis (PCA) for all the composite variables except organisational structure and organisational culture extracted only one underlying component with an eigenvalue greater than 1, explaining from 55.07% to 69.26% of the total variance in the original sets of the variables. The component loadings for all items were greater than the accepted minimum value of 0.4.

In terms of organisational structure, the item OS1 had heavy loadings and was deleted; only the composite variable of organisational structure was recalculated using OS2, OS3, OS4, OS5, OS6, and OS7. The result yielded a good reliability of 0.798 and an eigenvalue greater than 1,

explaining 57.30% of the total variance. Therefore, it was used as the measure of organisational structure in the main study.

Similarly, in terms of organisational culture, the item OC5 was deleted. The composite variable was recalculated using only the three items (OC1, OC2, OC3, OC4, OC6 and OC7). After recalculation of organisation culture, the result yielded a high reliability (0.827) and an eigenvalue greater than 1, explaining 60.49% of the total variance. Therefore, it was used as the measure of organisational culture in the main study.

As a result of the preliminary analysis, appendices 1 and 2 show the final measurement scales in questionnaire and interview schedule used for the main study.

4.9 Administration of research instruments

The administration of the data collection progressed in two simultaneous phases in which the respondents were selected based on Krejcie and Morgan's (1970) formula, and proportional stratification according to the clinical units. The first phase involved the distribution and collection of questionnaires. The second phase entailed face-to-face semi-structured interviews with the deputy directors of nursing services (DDNS) in the selected teaching hospitals. Questionnaires (Appendix 1) were personally administered by the researcher with the support of research assistants and the researcher personally conducted the semi-structured interviews by using semi-structured interview guide (Appendix 2). The distribution and collection of the questionnaires and the interviews took place over a period of five months. However, the process of conducting the semi-structured interview was quite demanding because the hospitals were located in different states and the busy schedules of the deputy directors.

4.10 Data Analysis and Presentation

Data analysis is a practice in which raw data is ordered and organised so that useful information can be extracted from it (Ramohlale, 2014). Both the survey and the interviews data were analysed using suitable data analysis techniques. Quantitative data analysis was done by using SPSS AMOS software version 22.0. Qualitative data analysis was represented through content analysis.

4.10.1 Quantitative data

After the completion of data collection, the questionnaires responses were examined for errors and completeness prior to coding. The data was then inputted into the computer, coded and analysed with the SPSS software version 22 to generate descriptive statistics. Descriptive statistics analyses were conducted to provide an overview of the sample, summarising demographic details of the respondents.

Structural Equation Modeling (SEM) was employed using AMOS software version 22.0 to statistically assess the hypothesised relationships and test the theoretical model and factor analysis. SEM is a statistical approach to testing hypotheses about the relationships among observed and latent variables. Observed variables are also called indicator or manifest variables. Latent variables also denoted unobserved variables or factors (Hoyle, 1995). Nguyen (2010:114) citing Hair et al. (2006) highlighted that “SEM is an extension or a unique combination of several multivariate techniques such as multiple regression analysis”.

Baines and Langfield-Smith (2003) cited by Anderson (2009) succinctly point out that SEM analysis is used in preference to multiple regression analysis for three main reasons:

1. SEM estimates all coefficients in the model simultaneously. Therefore, the significance and strength of a particular relationship can be assessed in the context of the complete model.
2. In many models, an independent variable in one relationship becomes a dependent variable in other relationships, such as in this study. Regression cannot manage this type of relationship among variables and requires the use of hierarchical regression.
3. The issue of multicollinearity is a problem in multiple regression. In SEM, multicollinearity can be modelled, and thereby assessed, because the relationships between predictor variables can be modelled.

Tabachnick and Fidell (2001) suggest between 150 and 200 responses are desirable for SEM to analyse models, such as those in this study. The measurement model includes 61 measurement items describing 8 constructs. SEM analysis involves two steps: (i) factor analysis -- assessing confirmatory measurement models and testing for specific evidence of construct validity; and (ii) path analysis- assessing confirmatory structural models (Hair et al.,

2006). The fit statistics of the overall structural model are assessed, and the individual parameter estimates are examined to test the hypothesised theoretical relationships.

4.10.2 Qualitative data

Qualitative data from the interviews conducted was derived from meanings expressed through words and the use of conceptualisation. Content analysis involves creating codes and themes qualitatively, and then counting the number of times they occur in the text data (Creswell, 2009). Thus, the researcher categorised emerging themes and patterns from the responses and grouped them together. Thus, this made it easier to analyse the data. Content analysis allows the study to extract detailed, rich, and complex data accounts from the interviews. Table 4.14 below maps the research questions to data collection instruments and data analysis technique.

Table 4.14: Research questions, research approach, data collection method and data analysis technique

Research question	Research hypothesis	Research approach	Data collection	Data analysis technique
What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?	H ₀₁ : IT support does not have a positive influence on nursing care performance. H ₀₂ : Organisational culture does not have a positive influence on nursing care performance. H ₀₃ : Organisational structure does not have a positive influence on nursing care performance.	Quantitative	Survey questionnaire and semi-structured interview	SPSS version 22.0 to analyse the demographic data; and SEM for quantitative data. Content analysis for qualitative data.

Research question	Research hypothesis	Research approach	Data collection	Data analysis technique
	H04: Knowledge Process capability does not have a positive influence on nursing care performance.			
What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance in health institutions in South-west Nigeria?	H05: IT support is not positively related to knowledge process in KM capability. H06: Culture is positively related to knowledge process in KM capability. H07: Structure is positively related to knowledge process in KM capability.	Quantitative	Survey questionnaire	SPSS version 22.0 to generate percentages; SEM analysis for quantitative data.
How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability	H8: The relationship between IT support and knowledge process in KM capability does not positively influence nursing care performance. H09: The relationship between culture and knowledge process in	Quantitative	Survey questionnaire	SPSS version 15.0 to generate percentages; factor analysis and SEM for quantitative data

Research question	Research hypothesis	Research approach	Data collection	Data analysis technique
affect nursing care performance in health institutions in South-west Nigeria?	KM capability does not positively influence nursing care performance. H ₁₀ : The relationship between structure and knowledge process in KM capability does not positively influence nursing care performance.			
How can KM capability be leveraged to support nursing care performance in health institutions in South-west Nigeria?		Qualitative	Semi-structured interview	Content analysis for qualitative data.

Creswell and Plano Clark (2007:128) highlighted “analysing the quantitative data using quantitative methods and the qualitative data using qualitative methods”. The analysis was systematically done in line with the key concerns of the inquiry, which made integration with qualitative data (also analysed in line with these concerns) quite easy.

4.11 Ethical considerations

Research involves collecting data from people (Punch, 2005); it is therefore important to anticipate ethical issues that may arise during research (Hesse-Bieber and Leavey, 2006). Ethical issues are given lot of importance in social science research. Several issues such as voluntary participation, no harm to the participants, ensuring anonymity and confidentiality, avoiding deception and fair reporting has been emphasised as some important ethical considerations in social science research (Babbie and Benaquisto, 2009).

In keeping with research ethics, permission was sought by the researcher from the two teaching hospitals to carry out the research. The teaching hospitals are University College Hospital (UCH) and Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC). Access to the field was attained through the ethics committee of both institutions. A letter of introduction was obtained from the researcher's supervisor to the Chief Medical Director of OAUTHC (see Appendix 8) and Chief Medical Director of UCH (see Appendix 8). A letter of self-introduction was also written to the relevant authorities (see Appendices 9 and 11) and a letter of introduction was replicated for the chairman of ethics and director of clinical services in OAUTHC and UCH. Ethical clearance was approved from UCH (see Appendices 12 and 13) and OAUTHC (see Appendix 16) and other relevant authorities (see Appendices 14, 15 and 17) before the commencement of the research.

Ethics approval for this research was sought through the School of Social Sciences, Faculty of Humanities of the University of Kwa-Zulu Natal. This was approved by the university's ethics committee which also stipulated ethics approval guidelines that were followed by the researcher (see Appendix 18). In addition to the ethics approval, an 'informed consent' form (see Appendix 7) as specified by the university was given to all the participants to sign before they engaged in research. This form acknowledges that participants' rights will be protected during data collection. Elements of the informed consent form include the following:

- (i) Identification of the researcher.
- (ii) Identification of the supervisor and institution.
- (iii) Identification of the purpose of the research.
- (iv) Guarantee that the participant can decide to not participate or withdraw from the research at any stage.

- (v) Guarantee of confidentiality and anonymity.
- (vi) Notation of no monetary gain for the participants.
- (vii) Provision of names of persons to contact if questions arise.

A preliminary visit was made to the field in August 2017 to introduce the research; pre-test and revise the data collection tools (see Appendices 1 and 2); and also establish contact with key people who provided guidance and logistical support during data collection.

4.12 Summary

This Chapter focused on the research methodology and design employed in the present study. The chapter discussed the research paradigms commonly used social science research and the pragmatic paradigm, which is consistent with the mixed methods approach that was employed for the study. The chapter further discussed the research approach, population of study, sample size, sampling procedures; data collection procedures; operationalisation of measures in the questionnaire, validity, and reliability of research instruments; results of the pilot study; data analysis and ethical considerations.

The chapter highlighted some themes that are vital to the study. Firstly, when conducting a study on knowledge management to improve performance of organisations, it is imperative to use mixed methods in order to generate rich data and unveil unbiased findings. Secondly, issues of validity and reliability are of utmost importance in confirming the trustworthiness of the research findings.

The present study generated data from 320 registered nurses through use of questionnaires and semi-structured interview with 14 deputy directors of nursing services. It must be specified that the research instruments played a vital role on the results that helped inform the findings obtained from the study. Additionally, employing the Statistical Package of Social Sciences (SPSS) for quantitative data analysis and content analysis for the qualitative data contributed significantly to the findings on knowledge management capability on nursing care. Lastly the data collected was based on the objectives of the research.

The next chapter presents the research findings.

CHAPTER FIVE

DATA PRESENTATION AND ANALYSIS

5.1 Introduction

The main objective of this study is to determine the influence of knowledge management capability (infrastructure capability and process capability) in nursing care performance in selected teaching hospitals in South-west Nigeria. The following research questions are addressed:

1. What are the factors of KM capability influencing nursing care performance in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?
4. How can KM capability be leveraged to support nursing care performance?

This chapter is organised along the themes of the research questions, key variables were gleaned from the theoretical framework, the research questions and hypotheses were tested, and broader issues related to the research problem. According to Creswell's (2008) proposition that in explanatory and exploratory designs, a quantitative data analysis can be done separately from qualitative data by the researcher, in this study, analysis of qualitative data is separated from the quantitative data.

This chapter presents the data collected through questionnaires and interviews that were administered to registered nurses (RNs) at the clinical units of Obafemi Awolowo University Teaching Hospital (OAUTHC) in Ile-Ife, Osun State, and the University College Hospital (UCH) in Ibadan, Oyo State. The two selected teaching hospitals are located in South-west Nigeria. Questionnaires were administered to the clinical nurses from the cadre of nursing officer 2 to assistant director of nursing services (ADNS), while the interviews were administered to the deputy directors of nursing services (DDNS).

The results reported in this chapter emanate from the convergent mixed methods design used in the study whereby quantitative and qualitative approaches were used to complement one another. The quantitative data obtained through the questionnaires was collated, cleaned, coded and analysed using structural equation modelling (SEM) by employing the Statistical Package for Social Sciences (SPSS) AMOS software version 22. In addition, the qualitative was analysed using content analysis. The findings are presented based on the research questions. The categories in the qualitative data were examined by employing content analysis and data with similar connotations were grouped together. The data are presented in figures, tables, and themes.

5.2 Response Rate

A sum of 320 questionnaires were distributed across the clinical units, out of which 298 registered nurses (RNs) completed and returned the questionnaires giving a response of 93%. Out of 14 deputy directors of nursing services (DDNS), 9 directors were interviewed, giving a response rate of 64%. Babbie and Mouton (2001:11) emphasise that:

“Overall rate of response is a guide to the representativeness of the sample of respondents. If a high response rate is achieved, there is less chance of significant response bias than in a low rate response. A response rate of 50 per cent as suitable, 60 per cent as good and 70 percent and above as very good for analysis and reporting of the findings”.

Therefore, based on these criteria, the response rate (93%) for this study was considered adequate.

The high response rate achieved was because of the support of the assistant deputy directors of each clinical unit in the two teaching hospitals. They were responsible for introducing the researcher to the RNs in each clinical unit and encouraged respondents to complete the questionnaire. Four field assistants helped the researcher in the distribution and follow-up of respondents to complete the questionnaires. The field assistants also ensured the questionnaires were properly filled. Each questionnaire was accompanied by a copy of the ethical clearance issued by the ethics office and a letter of approval issued by the Head of Department of clinical nursing services authorising the study. Table 5.1 presents the response rates from the selected teaching hospitals.

Table 5.1: Response rate from UCH and OAUTHC (RNs)

Health Institution	Expected respondents (N=320)	Actual respondents (N=298)	% of Actual respondents
UCH	196	186	94.90
OAUTHC	124	112	90.32
Total	320	298	93.13

RNs= Registered Nurses

The results presented in Table 5.1 show that out of the sum of 320 questionnaires that were distributed, respondents completed and returned 298 (93.13%) questionnaires. In this regard, 186 (94.90%) were returned from UCH, Ibadan and 112 (90.32%) from OAUTHC, Ile-Ife. From these results, it is evident that the highest return was from UCH, Ibadan. The survey was executed for a duration of five months from August 2017 to December 2017. The subsequent sections present the results of the findings.

5.3 Quantitative findings

This section presents the data collected through questionnaires that were administered to the registered nurses at Obafemi Awolowo University Teaching Hospital (OAUTHC), and the University College Hospital in Ibadan respectively. The information obtained from the respondents was collated, coded, and analysed using descriptive statistics (frequency counts, and percentages) and structural equation modelling (SEM). The significance level used was 0.05.

5.3.1 Demographic characteristics of the respondents

This section provides a summary of the demographic characteristics of the nurses at University College Hospital (UCH) and Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) that participated in the survey. “Demographic information is information about the important characteristics of a population, such as ethnicity, gender, age, education, profession, occupation, income level, and marital status. In survey research, the distribution of such characteristics within the population constitutes a very important

consideration” (OECD, 2013:11). The demographic information of the respondents is presented in tables 5.2 - 5.7 respectively.

5.3.1.1 Gender of respondents

The result of the gender of the registered nurses (RNs) in this study is depicted in Table 5.2.

Table 5.2: Gender of respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	63	21.1	21.1	21.1
	Female	235	78.9	78.9	100.0
	Total	298	100.0	100.0	

Overall, 63(21.1%) of the respondents were males and 235(78.9%) were females. The results indicated that there were more female nurses in the health institutions than males.

5.3.1.2 Age of respondents

The study investigated the age range of the respondents of the health institutions involved in the study. The result is presented in table 5.3.

Table 5.3: Age of respondents

Age range					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-25	21	7.0	7.0	7.0
	26-30	60	20.1	20.1	27.2
	31-35	63	21.1	21.1	48.3
	36-40	45	15.1	15.1	63.4
	41-45	43	14.4	14.4	77.9
	46-50	35	11.7	11.7	89.6
	51-55	22	7.4	7.4	97.0
	over55	9	3.0	3.0	100.0
	Total	298	100.0	100.0	

The results in the table above reveal the highest number of respondents (63, 21.1%) were in the age range of 31-35 years; followed by 60 (20.1%) of respondents who were in the age range of 26-30 years; 45(15.1%) were in the age range of 36-40 years followed by 43(14.4%) who were in the age range of 41-45 years; 35(11.7%) were in the age range of 46-50 years; 22(7.4%) belonged to the age range of 51-55 years, while the least 9(3%) belonged to the age range of over 55 years. The age range of the respondents indicates that most of the RNs belong to the age range of 31-35 years and the least number were over 55 years old.

5.3.1.3 Highest qualification of respondents

The investigation into respondents' highest academic qualification is displayed in Table 5.4.

Table 5.4: Highest qualification of respondents

Highest qualification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Registered nurses' certificate	145	48.6	48.6	48.5
	Bachelor of nursing	127	42.6	42.6	91.2
	Bachelor of technology	8	2.7	2.7	93.9
	Masters	16	5.5	5.5	99.4
	PhD	2	.6	.6	100.0
	Total	298	100.0	100.0	
Total		298	100.0		

The qualification status of the respondents in Table 5.4 shows that 145 (48.6%) were registered nurses; 127 (42.6%) had Bachelor of Nursing degree; 8 (2.7%) had Bachelor of Technology; 16 (5.4%) had Master's degree, while only 2 (0.6%) had PhD degree. The information of respondents' highest qualification status shows that most of the respondents were registered nurses, while the least had a PhD.

5.3.1.4 Total years of work experience

The study also examined the number of years of experience of the respondents on the job. The results are presented in Figure 5.5.

Table 5.5: Years of work experience

Total years of work experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	81	27.2	27.2	27.2
	6-10	60	20.1	20.1	47.3
	11-15	69	23.2	23.2	70.5
	16-20	42	14.1	14.1	84.6
	above20	46	15.4	15.4	100.0
	Total	298	100.0	100.0	

The result show that 81 (27.2%) of respondents had spent 1-5 years in the profession; 60 (20.1%) had spent 6-10 years in the profession; and 69(23.2%) had spent 11-15 years. Furthermore, 42(14.1%) had spent 16-20 years in the profession, while 46 (15.4%) had spent above 20 years in the profession. Results show the majority of the respondents were those with 1-5 years' work experience, while the least of the respondents had spent 16-20 years in the profession.

5.3.1.5 Clinical units of respondents

Teaching hospitals consist of various clinical units, traditionally called wards (particularly when they have beds for inpatients). The result of the clinical units of the respondents is depicted in Tables 5.6 and 5.7 respectively.

The combined analysis of the data obtained from the two hospitals reveal that 23 respondents (7.7%) were from outpatient followed by 21 (7%) from operating theatre, 21 (7%) from accident and emergency, 21 (7%) from Ear, Nose and Throat (ENT), 20 (6.7%) from surgical ward, 20 (6.7%) from paediatrics, 19 (6.4%) from ophthalmology, 17 (5.7%) from labour, 17 (5.7%) from orthopaedic, 16 (5.4%) from intensive care and 14 (4.7%) from virology.

Table 5.6: Clinical units of respondents

Clinical unit					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Outpatient	23	7.7	11.0	10.0
	Surgical	20	6.7	9.6	19.6
	Operating theatre	21	7.1	10.0	30.6
	Accident & emergency	21	7.1	10.0	40.7
	Paediatrics	20	6.7	9.6	50.2
	Intensive care	16	5.4	7.8	57.9
	Labour	17	5.7	8.1	66.0
	Ear, Nose and Throat	21	7.1	10.0	76.1
	Ophthalmology	19	6.4	9.1	85.2
	Orthopaedic	17	5.7	8.1	93.3
Virology	14	4.7	6.7	100.0	

Table 5.7: Clinical units of respondents (cont...)

other clinical units					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Antenatal	17	5.7	5.7	74.8
	Gynaecology	16	5.4	5.4	80.2
	Maternity	15	5.0	5.0	85.2
	Medical	17	5.7	5.7	90.9
	Mental health	15	5.0	5.0	96.0
	Renal	9	3.0	3.0	100.0
	Total	298	100.0	100.0	

Others were 16 (5.7%) from antenatal, 16 (5.4%) from gynaecology, 15 (5.0%) from maternity, 17 (5.7%) from medical, 15 (5.0%) from mental health and 12 (4.0) from renal. The majority of the respondents were from operating theatre ward and the least of the respondents were from renal ward.

5.3.1.6 Job title/designation of respondents

Job title/designation refers to the assigned role and career structure of the registered nurses. The nursing officer 11 is the entry cadre, while the deputy director of nursing service directs the activities of all other cadres from Assistant Director of Nursing Services(ADNS) to nursing officer11 (NO11).

The job designation of the respondents was also examined in the study. The results are displayed in Figure 5.8.

Table 5.8: Job title/designation of respondents

Job designation		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ADNS	34	11.4	11.4	11.4
	CNO	36	12.1	12.1	23.5
	ACNO	23	7.7	7.7	31.2
	SNO	71	23.8	23.8	55.0
	NO1	76	25.5	25.5	80.5
	NO 11	58	19.5	19.5	100.0
	Total	298	100.0	100.0	

The job titles of respondents were as follows in descending order: Assistant Director of Nursing Services (ADNS) (34, 11.4%), Chief Nursing Officer (CNO) (36, 12.1%), Assistant Chief Nursing Officer (ACNO) (23, 7.7%), Senior Nursing Officer (SNO) (71, 23.8%) Nursing officer 1(NO1) (76, 25.5%) and Nursing officer 2 (NO 11) (58, 19.5%). The results presented in table 5.8 reveal that most of the respondents were in the cadre of Nursing officer 1(NO1), while the least of the respondents were in the cadre of Assistant Chief Nursing Officer (ACNO).

5.3.2 Normality assessment

As stated by Kim (2013:52), “skewedness is a measure of the asymmetry of the distribution of a variable, while kurtosis is a measure of the peakedness of a distribution”. Kim (2013:52) citing West et al. (1995) highlighted that a “reference of substantial departure from normality is an absolute skew value > 2.1 , while the substantial departure from normality is an absolute kurtosis proper value > 7.1 . Thus, critical values for rejecting the null hypothesis need to be different according to the sample size as follows:

1. For small samples ($n < 50$), if absolute z-scores for either skewedness or kurtosis are larger than 1.96 which corresponds with alpha level 0.05, then reject the null hypothesis and conclude that the distribution of the sample is non-normal.
2. For medium-sized samples ($50 < n < 300$), reject the null hypothesis at absolute z-value over 3.29, which corresponds with alpha level 0.05, and conclude that the distribution of the sample is non-normal.

- For sample sizes greater than 300, depend on the histograms and the absolute values of skewedness and kurtosis without considering z-values. Either an absolute skew value larger than 2 or an absolute kurtosis (proper) larger than 7 may be used as reference values for determining substantial non-normality”.

It is important to investigate the normality distribution of the interval variables to select a suitable estimate in SEM. Kline (1998), pointed that a data set is assumed to have an extreme non-normality if the absolute values of skewedness or Kurtosis are larger than 2 and 7.

Referring to Table 5.9, values of skewedness and kurtosis were examined for the eight latent variables in the study. The values satisfied the assumption of normality; therefore, the data set was considered to have a moderately normal distribution.

Table 5.9: Skewedness and Kurtosis Statistics

Items	N	Mean	Std. Deviation	Skewedness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
IT1	298	3.56	1.177	-.742	.141	-.624	.281
IT2	298	3.34	1.111	-.530	.141	-.828	.281
IT3	298	3.68	1.095	-.943	.141	.142	.281
IT4	298	3.42	1.259	-.505	.141	-.978	.281
IT5	298	3.28	1.163	-.370	.141	-1.096	.281
IT6	298	3.49	1.132	-.745	.141	-.472	.281
IT7	298	3.65	1.122	-.922	.141	-.052	.281
IT8	298	3.65	1.125	-.829	.141	-.336	.281
OS1	298	3.32	1.231	-.500	.141	-1.034	.281
OS2	298	3.73	.869	-1.059	.141	.714	.281
OS3	298	3.59	.943	-1.027	.141	.329	.281
OS4	298	3.73	.881	-.905	.141	.338	.281
OS5	298	3.72	.884	-.945	.141	.192	.281
OS6	298	3.84	.823	-1.112	.141	1.083	.281
OS7	298	3.74	.836	-.973	.141	.526	.281

Items	N	Mean	Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OC1	298	4.22	.661	-.984	.141	2.362	.281
OC2	298	4.16	.699	-1.012	.141	2.051	.281
OC3	298	4.12	.722	-1.045	.141	1.930	.281
OC4	298	4.06	.752	-1.111	.141	2.098	.281
OC5	298	3.84	.942	-.872	.141	.161	.281
OC6	298	4.12	.741	-1.142	.141	2.335	.281
AP1	298	4.04	.719	-1.592	.141	4.539	.281
AP2	298	3.87	.933	-1.106	.141	1.036	.281
AP3	298	3.80	.964	-1.018	.141	.567	.281
AP4	298	3.77	.952	-.985	.141	.444	.281
AP5	298	3.84	.872	-1.194	.141	1.353	.281
AP6	298	3.71	.885	-.962	.141	.867	.281
AP7	298	3.80	.905	-.997	.141	.719	.281
AP8	298	3.72	.928	-.995	.141	.490	.281
CP1	298	3.72	.921	-1.007	.141	.664	.281
CP2	298	3.64	.888	-1.038	.141	.547	.281
CP3	298	3.73	.888	-1.140	.141	.960	.281
CP4	298	3.79	.880	-1.235	.141	1.302	.281
CP5	298	3.75	.887	-1.124	.141	1.137	.281
CP6	298	3.74	.933	-1.073	.141	.818	.281
CP7	298	3.78	.984	-1.125	.141	.789	.281
CP8	298	3.77	.980	-1.122	.141	.700	.281
APP1	298	3.86	.872	-.978	.141	.746	.281
APP2	298	3.89	.907	-.892	.141	.547	.281
APP3	298	3.85	.894	-1.127	.141	1.097	.281
APP4	298	3.87	.867	-1.093	.141	1.151	.281
APP5	298	3.93	.935	-1.079	.141	.965	.281
APP6	298	3.85	.887	-.990	.141	.799	.281

Items	N	Mean	Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
APP7	298	3.73	1.017	-.809	.141	.065	.281
APP8	298	3.73	.947	-.828	.141	.230	.281
PP1	298	3.67	.981	-.745	.141	-.135	.281
PP2	298	3.48	1.035	-.578	.141	-.633	.281
PP3	298	3.34	1.062	-.405	.141	-.910	.281
PP4	298	3.52	1.092	-.716	.141	-.309	.281
PP5	298	3.72	1.014	-.928	.141	.183	.281
PP6	298	3.72	1.041	-.846	.141	-.118	.281
PP7	298	3.63	1.040	-.786	.141	-.120	.281
PP8	298	3.53	1.019	-.554	.141	-.661	.281
NP1	298	3.98	.787	-1.217	.141	2.361	.281
NP2	298	4.15	.657	-1.173	.141	4.208	.281
NP3	298	4.01	.747	-1.044	.141	2.172	.281
NP4	298	4.12	.727	-1.243	.141	3.151	.281
NP5	298	4.01	.849	-1.343	.141	2.400	.281
Valid (listwise)	N 298						

Deviation from normality of a distribution is achieved when absolute values of the skew > 2 and Kurtosis > 7 , if otherwise then the distribution is taken to follow normal distribution (Kline, 1998 cited in Nguyet, 2010). From the above none of the statistic of the items is > 2 for skew and > 7 for kurtosis, hence the above results show the evidence of normality.

5.3.3 Modelling of measurement model

The first step in SEM approach is assessing confirmatory measurement models that involve linking the observed variable (construct) and unobservable variable to each other (Anderson and Gerbing, 1988). Byrne (2001) cited by Cho (2011) highlighted that SEM is suitable for

dataset that consist of several unobservable variables that are measured by observed values from survey instruments. In this study, knowledge management capability consists of knowledge infrastructure and process capabilities which are the second order latent variables. Knowledge infrastructure capability includes three first order variables: information technology support, organisational structure, and organisational culture, while knowledge process capability includes four first order variables: acquisition, conversion, application, and protection processes. The measurement scales used in this study were adapted from previous research and pilot study was conducted to pre-test the measurement scales. As emphasised by Hair et al. (2006), the model fit of the proposed measurement model was checked by performing a confirmatory factor analysis (CFA).

Various researchers proposed a few criteria for examining the model fit while carrying out a CFA. However, six criteria were adopted in this study which includes the chi-square, the chi-square divided by the degree of freedom (CMIN/DF), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Root Mean Square Residual (RMR), and Root Mean Square Error of Approximation (RMSEA).

The GFI calculates the estimated population co-variances to the observed variances (Schumacker and Lomax, 2010). The value ranges from 0 to 1 which increases with larger samples. A value of 0.9 has been recommended for a good-fit model; however, in the case of low sample sizes, the value of 0.95 is suitable (Byrne, 2001). The CFI compares the improved fit in the researcher's model when compared to the null model (Kline, 2005). The accepted statistic ranges from 0 to 1 with values of 0.95 which indicates a good fit (Byrne, 2001). The RMR is "the average residual value derived from the fitting of the variance-covariance matrix for the hypothesised model to the variance-covariance matrix of the sample data" (Byrne, 2001:83), the smaller the RMR, the better the model. An RMR of zero indicates that the model is a perfect fit. In general, when a RMR is smaller than 0.05, it indicates that the model is relatively good-fitting.

The RMSEA measures how well the model would fit the population covariance matrix, while considering the error of approximation in the population (Byrne, 2001). As stated by Cho (2011:121), "values of the RMSEA that are around 0.05 or less indicate that the model provides a quality fit. On the other hand, an RMSEA of around 0.08 to 0.10 indicates that the fit of the

model is questionable, while an RMSEA greater than .10 indicates a poor fitting model". In this study, each of these criteria for good model fit was used to examine the researcher's model.

The following sections present the results of the CFA analysis to certify the validity of the constructs.

5.3.3.1 Confirmatory Factor Analysis for Information Technology

Information Technology is measured by eight items IT1 to IT8. The validity assessment of information technology construct was performed using CFA. The preliminary results of the CFA showed that the criteria for a good model fit were not met. The Chi-Square value was 126.105 at $p=0.000$ with 20 degrees of freedom. The CMIN/DF value was 6.305. In addition, GFI value was 0.904 and CFI was 0.936. The root mean square error of approximation (RMSEA) was 0.134 and the root mean square residual (RMR) was 0.054. Positive values indicated for the standardised regression weights within the range of 0.67 to 0.87. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. A complete assessment of the model diagnostics from CFA implied that items IT1, IT2, and IT8 should be deleted.

The CFA results after the improvement is displayed in Figure 5.1. The Chi-square value ($\chi^2=10.720$) was statistically significant at $p>0.01$ with 5 degrees of freedom which showed the model had a good-fit. CMIN/DF value (2.144) was within the range of 3 to 1 which showed the model has a good fit. In addition, GFI value (0.986) satisfied the general criteria for a good-fitting model more than 0.9. CFI value was more than 0.9 (0.993) which also satisfied the criteria for a good-fitting model. The RMR was 0.024 which satisfied the general criteria of 0 or smaller 0.05 indicating the model has a good-fitting.

The RMSEA value (0.062) satisfied the general criteria for a good-fitting model, ranging from 0.05 to 0.08. All factor loadings exceeded 0.70. The construct reliability (CR) value was 0.963 which also met the general criteria. Overall, these results submit that the measurement model of information technology support seemed to be a good-fitting model; as a result, five items (IT3, IT4, IT5, IT6 and IT7) were retained to measure the information technology construct. Figure 5.1 shows the CFA results for information technology.

$\chi^2 = 10.720, df = 5; \chi^2 / df = 2.144; RMR = 0.024; CFI = 0.993; GFI = 0.986; RMSEA = 0.062; p = 0.057$

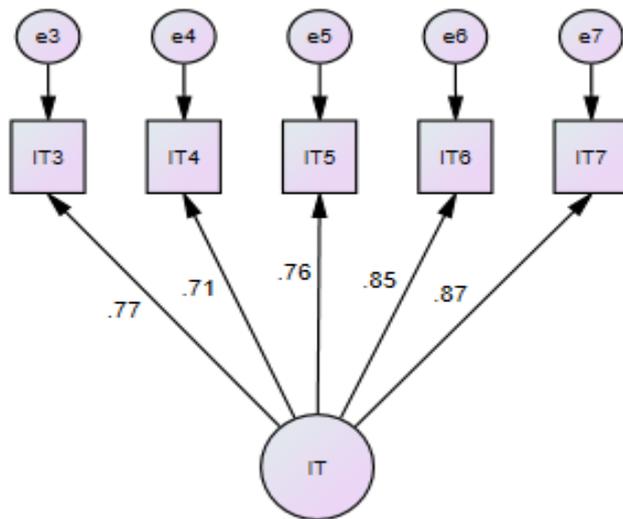


Figure 5.1: CFA results for Information Technology

5.3.3.2 Confirmatory Factor Analysis for Organisational Structure

Organisational structure is measured by six items (OS2, OS3, OS4, OS5, OS6 and OS7). The measurement model of organisational structure was evaluated by conducting a CFA. Preliminary results indicated that the values did not meet the criteria of a good fitting model.

After improvement, the Chi-square value was 108.456 at a statistically significant value of $p > 0.01$ and CMIN/DF value was 12.051. In addition, the goodness-of-fit index (GFI) was 0.883 and comparative fit index (CFI) was 0.870. The root mean square error of approximation (RMSEA) was 0.193 and the root mean square residual (RMR) was 0.065. The values for the standardised regression weights ranged from 0.53 to 0.88. The values of CMIN/DF and GFI did not satisfy the criteria for a good fitting model of 3 to 1. Items OS3 and OS4 caused multicollinearity issues, hence was deleted. More so, the GFI (< 0.9), CFI (incremental fit < 0.9 cut-off) and RMSEA (outside acceptable range) suggested that the measurement of organisation structure did not provide a reasonably good fit. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices.

The outcome of the model improvement revealed the Chi-square was 7.109 at a statistically insignificant value $p < 0.01$. CMIN/DF value (1.422) which was within the range of 3 to 1 showed the model was a good fitting one. In addition, the GFI was 0.991, which met the accepted value of a good fitting model. The value of CFI (0.996) also satisfied the accepted value for a good-fitting model. The RMR was 0.032 which satisfied the general criteria of 0 or smaller, 0.05 indicated the model has a good-fitting.

The RMSEA value (0.038) satisfied the general criteria for a good-fitting model, ranging from 0.05 to 0.08. These results indicated that the measurement model of organisational structure provided a good fit. Thus, the items (OS2, OS5, OS6, and OS7) were employed to examine organisational structure construct.

The values for entire factor loadings exceeded 0.70 except for item OS2 which was 0.48. An acceptable value (0.828) was also indicated for the construct reliability. Figure 5.2 presents the CFA results for organisational structure.

$$\chi^2 = 7.1091, df = 5; \chi^2 / df = 1.422; CFI = 0.996; RMR = 0.032; GFI = 0.991; RMSEA = 0.038; p = 0.213$$

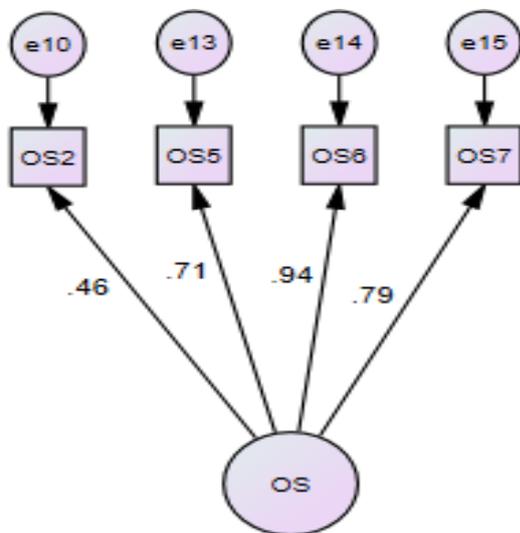


Figure 5.2: CFA results for Organisational Structure

5.3.3.3 Confirmatory Factor Analysis for Organisational Culture

Organisational culture is measured by five items: OC1, OC2, OC3, OC4, and OC6. The preliminary assessment of CFA indicated that the model did not meet the accepted criteria for

a good fitting model. The Chi-square value was 95.103 at a statistically significant value of $p > 0.01$ and CMIN/DF value was 19.021. In addition, the goodness-of-fit index (GFI) was 0.886, and the comparative fit index (CFI) was 0.852. The root mean square error of approximation (RMSEA) was 0.246 and the root mean square residual (RMR) was 0.037. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. As a result of the complete assessment of the model fit indices from CFA, the item OC1 was deleted.

After improvement, the Chi-square value was 3.798 at statistically insignificant $p > 0.01$. The CMIN/DF value (2.323) which was within the range of 3 to 1, indicated the model had a good fit. In addition, the values of GFI (0.992) and CFI (0.977) also satisfied the general criteria for a good-fitting model, more than 0.9. The RMR was 0.019 which met the general criteria of 0 or smaller (0.05) indicating the model has a good-fitting. The RMSEA (0.067) also met the accepted criteria for a good-fitting model, ranging from 0.05 to 0.08, indicated goodness-of-fit.

All factor loadings ranged from 0.61 to 0.76. These results indicated that the measurement model of organisational culture was a good fitting one; thus, four items (OC2, OC3, OC4 and OC6) were used to measure organisational culture. Figure 5.3 presents the fit indices summary provided by the CFA output.

$$\chi^2 = 3.798, df = 2; \chi^2 / df = 2.323; CFI = 0.977; RMR = 0.019; GFI = 0.992; RMSEA = 0.067; p = 0.150$$

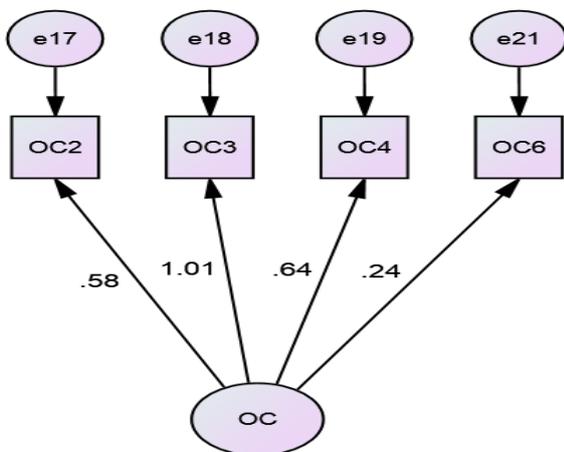


Figure 5.3: CFA results for Organisational Culture

Table 5.10: Summary of the model fit indices for IT, OS and OC, AP, CP, APP and PP

Model	P value	(χ^2)	DF	CMIN/DF	GFI	CFI	RMR	RMSEA
IT	0.057	10.720	5	2.144	0.986	0.993	0.024	0.062
OS	0.213	7.109	5	1.422	0.991	0.996	0.032	0.038
OC	0.150	3.798	2	2.323	0.992	0.977	0.019	0.067
AP	0.259	11.244	9	1.249	0.988	0.977	0.015	0.029
CP	0.055	10.810	5	2.162	0.986	0.994	0.013	0.063
APP	0.855	1.954	5	0.391	0.997	1.000	0.006	0.000
PP	0.443	4.781	5	0.956	0.993	1.000	0.019	0.000

Note IT=Information Technology; OS=Organisational Structure; OS= Organisational Culture AP=Acquisition Process; CP=Conversion Process; APP=Application Process; PP=Protection Process.

Table 5.11: Summary of the model fit indices for NP, KIC and KPC

Model	P value	(χ^2)	DF	CMIN/DF	GFI	CFI	RMR	RMSEA
NP	0.799	0.450	2	0.225	0.999	1.000	0.004	0.000
KIC	0.000	147.841	74	1.998	0.934	0.961	0.054	0.058
KPC	0.000	323.592	185	1.749	0.910	0.961	0.038	0.050

Note NP=Nursing care Performance; KIC= Knowledge Infrastructure Capability; KPC=Knowledge Process Capability.

5.3.3.4 Confirmatory Factor Analysis for Knowledge Infrastructure Capability

Knowledge Infrastructure capability (KIC) is the measurement model that comprises three items which include information technology, organisational structure and organisational culture. The measurement model for KIC was assessed by conducting a CFA. The results indicated that the output had a good fit. The value of the Chi-square was 147.841 with 74 degrees of freedom at a statistically significant value of $p > 0.01$. The value CMIN/DF was 1.998 which was within the range of 3 to 1, which indicated the model had a good fit. In addition, the values of GFI (0.934) and CFI (0.961) met the accepted criteria for a good-fitting model.

The RMR was 0.040 which met the general criteria of 0 or smaller (0.05) indicating the model has a good-fitting. The RMSEA was 0.058 also met the accepted criteria for a good-fitting model, which should range from 0.05 to 0.08, indicating goodness-of-fit. These results indicated that the measurement model of knowledge infrastructure capability provided a reasonably good fit.

Furthermore, all factor loadings ranged from 0.622-0.861 except the value associated with OC construct (0.400). The composite reliability (0.965) of all individual constructs was found to be satisfactory. The estimated values of the inter-correlations among the three constructs of KIC as presented in Figure 5.8b indicated that the values which ranged from 0.24 to 0.92 were lower than the general criteria of 0.90. This suggests the constructs are distinct (discriminant validity). Collectively, the evidence supports the validity of the measurement model. Figure 5.4 presents the summary of the fit indices provided by the CFA output, while Figure 5.4 presents the results of construct discriminant validity for knowledge infrastructure capability.

$$\chi^2 = 147.841, df = 74; \chi^2 / df = 1.998; CFI = 0.961; GFI = 0.934; RMSEA = 0.058; RMR = 0.040; p = 0.000$$

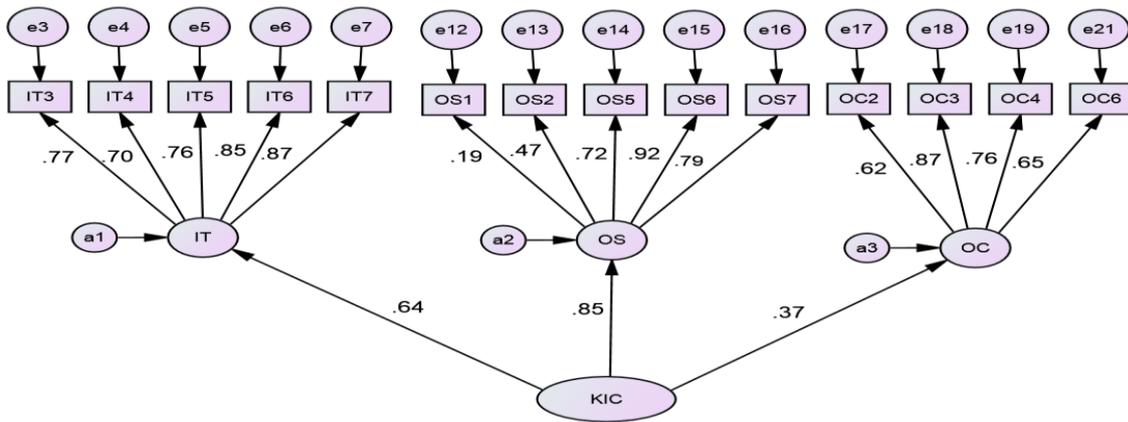


Figure 5.4: CFA results for Knowledge Infrastructure Capability

$$\chi^2 = 112.657, df = 62; \chi^2 / df = 1.817; CFI = 1.000; GFI = 0.946; RMSEA = 0.000; RMR = 0.054; p = 0.799$$

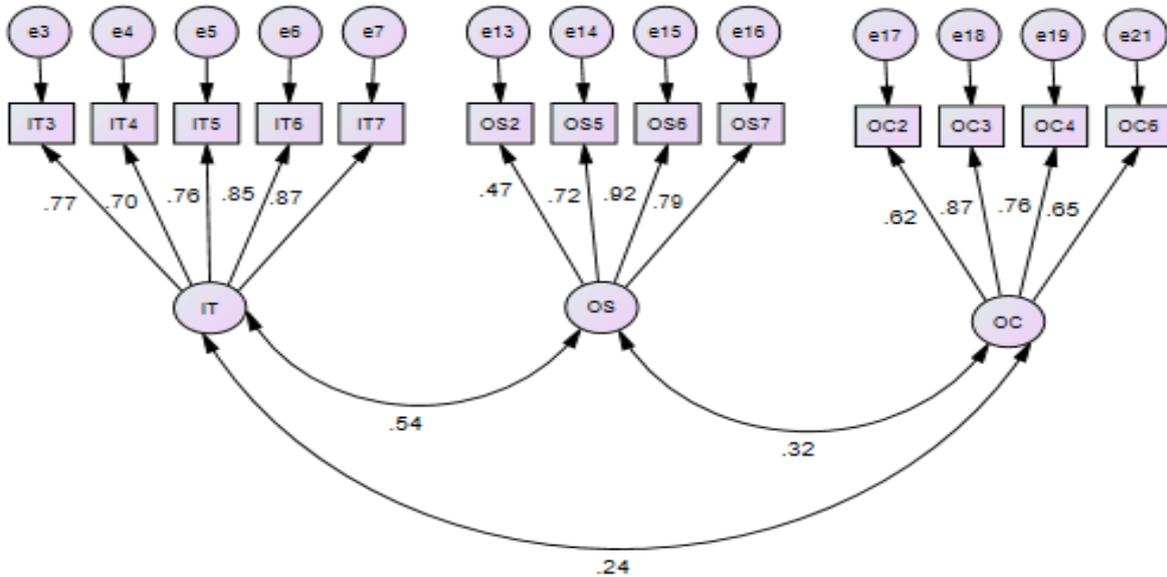


Figure 5.5: Construct Discriminant Validity for Knowledge Infrastructure Capability

5.3.3.5 Confirmatory Factor Analysis for Knowledge Acquisition Process

Knowledge acquisition process is measured by eight items AP1 to AP8. The initial results of CFA carried out to examine the measurement model of knowledge acquisition process showed that the Chi-square value was 96.479 at $p=0.05$. The value of CMIN/DF was 4.824. In addition,

the GFI was 0.924 and CFI was 0.939. The root mean square error of approximation (RMSEA) was 0.113. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. A complete assessment of the model diagnostics by CFA implied that items AP6 and AP7 should be deleted.

After improvement, the value of the Chi-square was 11.244 with $p > 0.01$. The value of CMIN/DF (1.249) which was within the range of 3 to 1 implied the model had an acceptable fit. In addition, the values of GFI (0.988) and CFI (0.977) met the acceptable criteria for a good-fitting model more than 0.9. The RMR was 0.015 which met the acceptable value of 0 or smaller (0.05) which indicated the model has a good-fitting. The RMSEA (0.029) also indicated a quality fit. These results showed that the measurement model of knowledge acquisition process was a good fitting model.

Furthermore, all factor loadings ranged from 0.60 to 0.83. All individual constructs had a satisfactory composite reliability of 0.938. Collectively, the results support the convergent validity of the measurement model. Six items (AP1, AP2, AP3, AP4, AP5 and AP8) were retained to measure knowledge acquisition construct. Figure 5.6 presents the summary of the CFA output.

$$\chi^2 = 11.244, df = 9; \chi^2/df = 1.249; CFI = 0.997; GFI = 0.988; RMR = 0.015; RMSEA = 0.029; p = 0.259$$

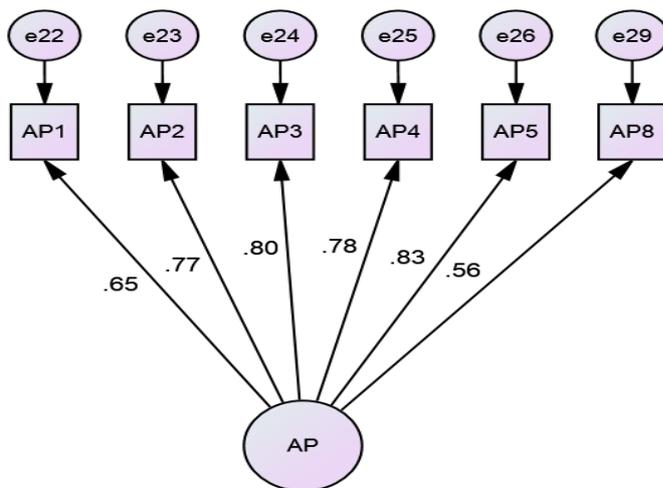


Figure 5.6: CFA results for Knowledge Acquisition Process

5.3.3.6 Confirmatory Factor Analysis for Knowledge Conversion Process

Knowledge Conversion is measured by eight items CP1 to CP8. The preliminary results of CFA conducted indicated that the model fit indices did not satisfy the criteria for a good fit. The Chi-square value was 158.903 at a statistically significant value of $p < 0.01$ and CMIN/DF value was 7.945. In addition, the GFI was 0.877 and comparative fit index CFI was 0.923, while the RMSEA was 0.153. The values of CMIN/DF, GFI, and RMSEA did not satisfy the general criteria of a good-fitting model. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. A complete assessment of the model diagnostics from CFA indicated that items CP2, CP4, and CP7 should be deleted.

After improvement, the Chi-square value was 10.810 at a statistically significant value of $p = 0.05$. The CMIN/DF was 2.162 in the accepted range of 3 to 1, indicating the model had a good fit. In addition, the GFI (0.986) and CFI (0.994) met the acceptable threshold of a good-fitting model more than 0.9. The RMR was 0.013 which satisfied the general criteria of 0 or smaller (0.05) indicating the model has a good-fitting. The RMSEA was 0.063 which met the acceptable criteria for a good-fitting model, ranging from 0.05 to 0.08. These results however indicated that the measurement model of knowledge conversion process provided an acceptable good fit. The items CP1, CP3, CP5, CP6, and CP8 were used to measure knowledge conversion process

Furthermore, all factor loadings exceeded 0.50 and ranged from 0.76 to 0.83. The individual constructs had a satisfactory composite reliability of 0.967 which was acceptable. Figure 5.7 presents the results of the CFA output.

$$\chi^2 = 10.810, df = 5; \chi^2/df = 2.162; CFI = 0.994; GFI = 0.986; RMSEA = 0.063; RMR = 0.013; p = 0.055$$

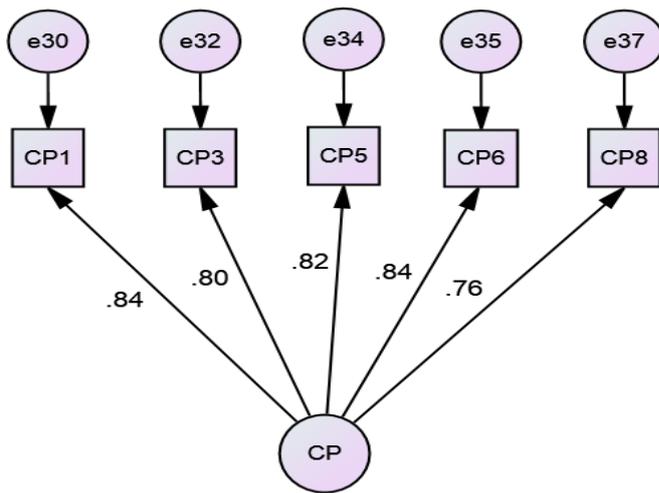


Figure 5.7: CFA results for Knowledge Conversion Process

5.3.3.7 Confirmatory Factor Analysis for Knowledge Application Process

Knowledge application process is measured by eight items, AP1 to AP8. The preliminary results of the CFA conducted to evaluate the measurement model of knowledge application process did not satisfy the accepted criteria for a good fit.

The Chi-square value was 82.986 at a statistically significant value of $p < 0.01$. The value of CMIN/DF was 4.149, while the RMSEA was 0.103. In addition, the GFI (0.934) and CFI (0.960) met the acceptable threshold of a good-fitting model more than 0.9. The values of CMIN/DF, and RMSEA did not satisfy the general criteria of a good-fitting model. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. A complete assessment of CFA indicated that items CP2, CP4, and CP7 should be deleted.

After improvement, the Chi-square value was 1.954 with associated p -value of 0.855. The value of CMIN/DF (0.391) was within the range of 3 to 1, indicating the model had an acceptable fit. In addition, the GFI which was 0.997 and the CFI which was 1.000 both met the accepted criteria for a good-fitting model, more than 0.9. The RMR was 0.006 which satisfied the general criteria of 0 or smaller (0.05) which indicated the model has a good-fitting. The RMSEA (0.000) did not meet the acceptable criteria for a good-fitting model, ranging from 0.05 to 0.08., indicating a bad fit. However, these results indicated that the measurement model of cultural infrastructure provided an acceptable good fit. The five items (APP3, APP4, APP5, APP6 and APP8) were retained to measure knowledge application process construct.

Furthermore, all factor loadings exceeded 0.50 and ranged from 0.72 to 0.83. The individual constructs had a satisfactory composite reliability (CR) of 0.967. Figure 5.8 presents the results of the CFA output.

$$\chi^2 = 1.954, df = 5; \chi^2 / df = 0.391; CFI = 1.000; GFI = 0.997; RMR = 0.006; RMSEA = 0.000; p = 0.855$$

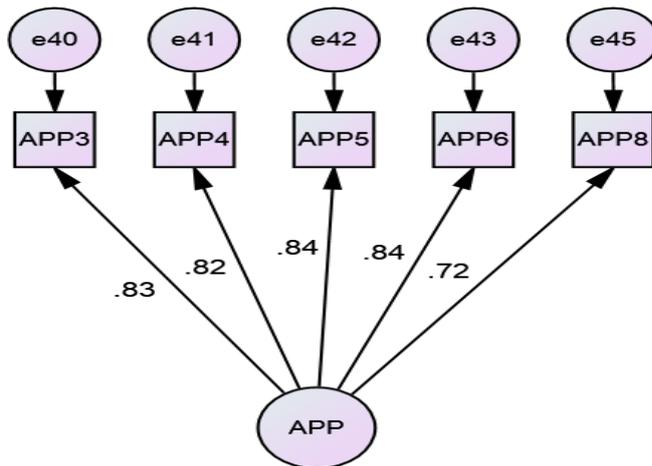


Figure 5.8: CFA results for Knowledge Application Process

5.3.3.8 Confirmatory Factor Analysis for Knowledge Protection Process

Knowledge protection process is measured by eight items, PP1 to PP8. The preliminary results of the CFA conducted to evaluate the measurement model of knowledge protection process did not satisfy the accepted criteria for a good fit. The chi-square value was 160.161 at a statistically significant value of $p < 0.01$. The value of CMIN/DF was 8.008. In addition, the GFI was 0.876 and the CFI was 0.871, while the RMSEA was 0.154. These results did not meet the general criteria of a good-fitting model which suggested that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. A complete assessment of the model diagnostics from CFA indicated that items PP1, PP2, and PP4 should be deleted.

After improvement on the measurement model, the chi-square value was 4.781 with an associated p -value of 0.443. The value of CMIN/DF (0.95) was not within the range of 3 to 1; though still acceptable. In addition, the GFI (0.993) and CFI (1.000) met the accepted criteria for a good-fitting model, more than 0.9. The RMR was 0.019 which satisfied the general criteria

of 0 or smaller (0.05) indicating the model has a good-fitting. The RMSEA was 0.000, which did not meet the accepted criteria for a good-fitting model, ranging from 0.05 to 0.08, indicating a bad-fit. However, these results suggest that the measurement model of knowledge protection provided a reasonably good fit. Therefore, the four items (PP3, PP5, PP6, PP7 and PP8) were retained to measure knowledge protection construct.

Furthermore, all factor loadings exceeded 0.50 and were within the range of 0.62 to 0.80. All individual constructs also had a satisfactory composite reliability (CR=0.945). Figure 5.9 presents the summary of the CFA output.

$$\chi^2 = 4.781, df = 5; \chi^2/df = 0.956; CFI = 0.1.000; GFI = 0.993; RMR = 0.019; RMSEA = 0.000; p = 0.443$$

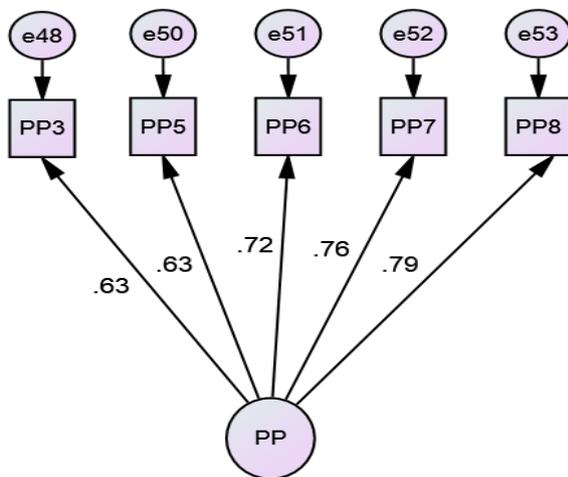


Figure 5.9: CFA results for Knowledge Protection Process

5.3.3.9 Confirmatory Factor Analysis for Knowledge Process Capability

Knowledge process capability (KPC) is the measurement model that comprises four items which include knowledge acquisition, conversion, application and protection processes. A CFA was employed to check the validity of the measurement model validity of this construct. The results of the CFA indicated that the measurement model is a significant fit to the data.

The Chi-square value was 323.592 with 185 degrees of freedom at p=0.000. The value of the CMIN/DF was 1.749 which was within the range of 3 to 1, which indicated the model had a good fit. In addition, the GFI was 0.910 and CFI was 0.961 which satisfied the general criteria for a good-fitting model more than 0.9. The RMR was 0.038 which satisfied the general criteria

that for a good-fitting model, the RMR should be less than 0.05. The RMSEA which was 0.05 also met the accepted criteria for a good-fit model ranging from 0.05 to 0.08 indicating goodness-of-fit. The CFA output indicated that the measurement model of knowledge infrastructure capability has a good-fit.

Furthermore, all factor loadings exceeded 0.50 except for the PP construct (0.487) which was slightly lower but acceptable. The composite reliability of all individual constructs was also found to be satisfactory (CR=0.960). An investigation of inter-correlations between the three constructs of knowledge infrastructure capability indicated the estimates ranged from 0.28-0.84 (Figure 5.9b) indicating the distinctness among the constructs.

Collectively, the evidence supports the validity of the measurement model. Figure 5.10 presents the results of the CFA output, while figure 5.11 presents the construct discriminant validity for Knowledge Process Capability.

$$\chi^2 = 323.592, df = 185; \chi^2 / df = 1.749; CFI = 0.961; GFI = 0.910; RMSEA = 0.050; RMR = 0.038; p = 0.000$$

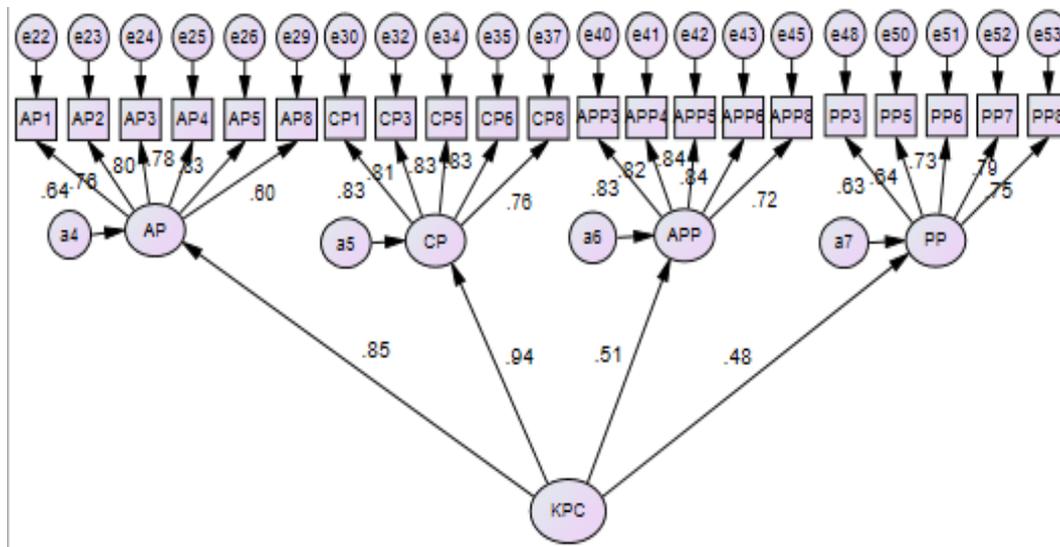


Figure 5.10: CFA result for Knowledge Process Capability

$$\chi^2 = 322.924, df = 183; \chi^2 / df = 1.765; CFI = 0.961; GFI = 0.910; RMSEA = 0.051; RMR = 0.037; p = 0.000$$

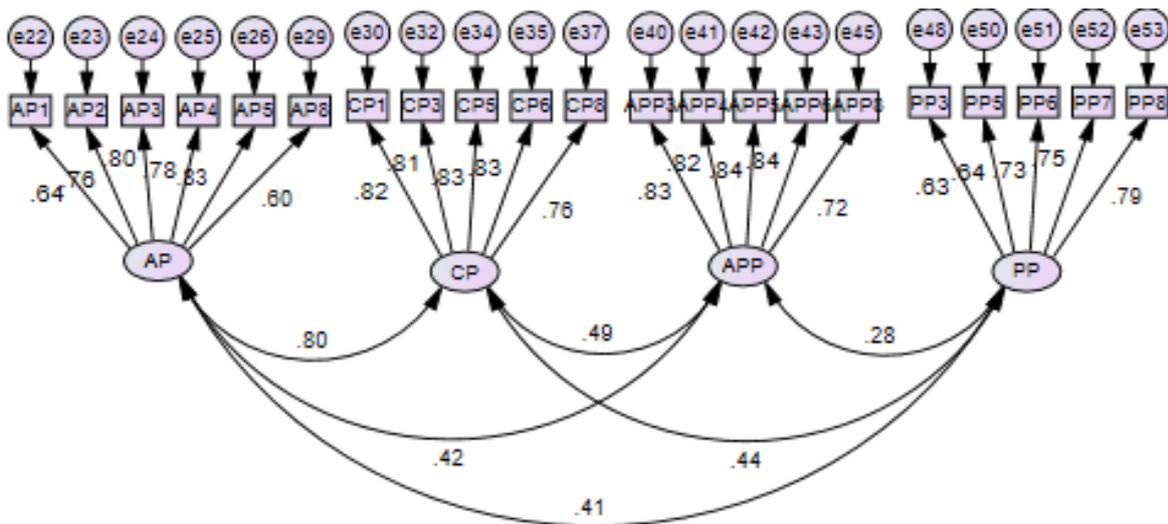


Figure 5.11: Construct Discriminant Validity for Knowledge Process Capability (KPC)

5.3.3.10 Confirmatory Factor Analysis for Knowledge Management Capability

The knowledge management capability (KMC) is the measurement model that comprises the sub dimensions of knowledge infrastructure capability (KIC) and knowledge process capability (KPC). Hence, it is considered as a multidimensional construct. As a result of the validity inspection conducted on individual items under KMC using CFA, all the necessary conditions for the measurement model to be accepted were satisfied.

A CFA was employed to check the validity of the measurement model validity of KMC. The results of the CFA indicated that the measurement model indicated a significant fit to the data. All factor loadings were found significant and ranged from 0.61 to 0.84 except for OS2 with an associated value of 0.48 which is fair but less than 0.50. Since the relevant constructs were still satisfied, there was no need for deletion or dropping any item from the measurement model. The calculated chi-square value was 866.294 with 520 degrees of freedom with an associated statistically significant p-value (0.000) < 0.001. The GFI was 0.860 which did not satisfy the accepted criteria for a good-fitting model (more than 0.9), though acceptable. The CFI was 0.940 which satisfied the accepted criteria of more than 0.9 for a good-fitting model. The RMSEA was 0.047, which did not meet the accepted criteria for a good-fitting model, ranging from 0.05 to 0.08. These results suggest that the measurement model of knowledge management capability provided a reasonably good fit of the data. In addition, the composite reliability (CR) for all individual constructs were found to be significant since the respective CR are greater than 0.70. The observed inter-construct correlation coefficient estimated a fall

below 0.90 with p-value 0.000. This is referred to as distinctness in construct or discriminant validity. Therefore, it can be concluded that KMC is a second order construct composed of KIC and KPC. Figure 5.12 presents the results provided by the CFA output.

$$\chi^2 = 866.294, df = 520; \chi^2/df = 1.666; CFI = 0.940; GFI = 0.860; RMSEA = 0.047; RMR = 0.049$$

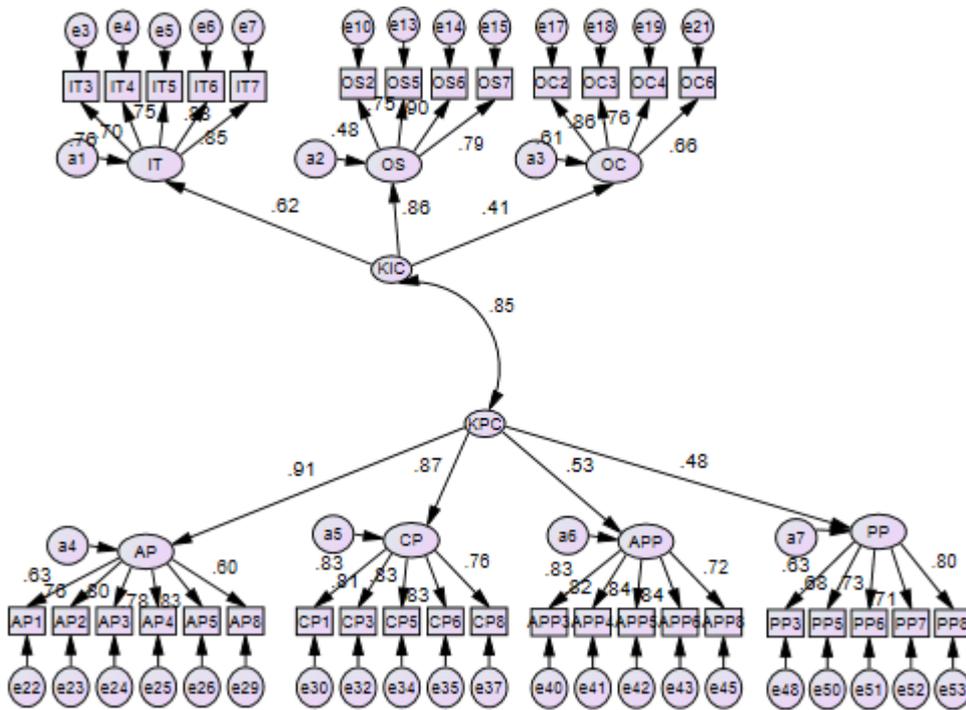


Figure 5.12: CFA results for Knowledge Management Capability

5.3.3.11 Confirmatory Factor Analysis for Nursing care performance

Nursing care performance is measured by five items from NP1 to NP5. A CFA was employed in examining the validity of nursing care performance. The initial results of CFA were chi-square = 50.046; p=0.000; df= 5; CMIN/DF = 10.009; GFI = 0.937; CFI = 0.871; and RMSEA = 0.174. Factor loadings were found to be positive and ranged from 0.67 to 0.87. The values of CMIN/DF (>3), CFI (< 0.9) and RMSEA (outside acceptable range) suggested that the measurement of nursing care performance did not provide a reasonably good fit. This implies that there is need for improvement on the measurement model. Improvement was done via path estimates, standardised residuals, and modification indices. A complete assessment of the model diagnostics from CFA indicates that items NP4 should be deleted.

After improvement, the Chi-square = 0.450; df= 2; p=0.799; CMIN/DF =1.225; GFI=0.939; CFI=1.000; RMR= 0.004; RMSEA=0.000 showed the results except that of RMSEA; these satisfied the accepted criteria for a good-fitting model. The RMSEA did not satisfy the acceptable criteria of the range of 0.05 to 0.08 for a good-fitting model. However, these results suggest that the measurement model of nursing care performance provided a reasonably good fit to the data. Therefore, the four items (NP1, NP2, NP3 and NP5) were retained to measure nursing care performance construct.

Furthermore, all factor loadings exceeded 0.50, and ranged from 0.59 to 0.80. All constructs had an acceptable composite reliability (CR=0.961). The composite reliability of all individual constructs was also found to be satisfactory. In Figure 5.13, the CFA output is presented.

$$\chi^2 = 0.450, df = 2; \chi^2 / df = 1.225; CFI = 1.000; GFI = 0.939; RMSEA = 0.000; p = 0.799$$

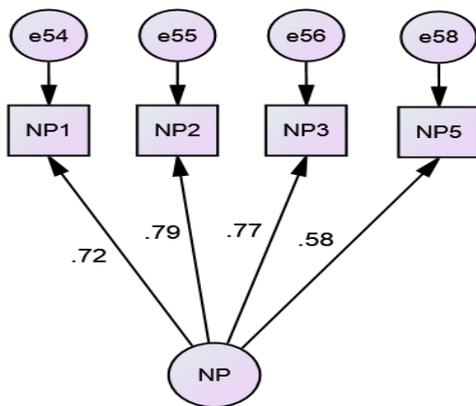


Figure 5.13: CFA results for Nursing care performance

5.3.4 Overall measurement model

A CFA was conducted to assess the overall measurement model which showed that the model had a good-fit; this indicated that the hypothesised model matches the theoretical expectation.

The CFA results for the overall model were: $\chi^2 = 1246.041, df = 692; \chi^2 / df = 1.801; CFI = 0.913; GFI = 0.831; RMSEA = 0.052; RMR = 0.055; p = 0.000$. Figure 5.9 displays the CFA output of the overall measurement model.

Table 5.12a and 5.12b displays the estimated parameter values for all the constructs. All factor loadings exceeded the acceptable value of 0.50 and ranged from 0.59 for item NP5 to 0.90 for

OS6 except for item OS2 which was 0.48. All individual constructs had a satisfactory composite reliability (above 0.70)

The observed inter-construct correlation coefficient displayed distinctness in construct and the correlation coefficient was lower than the accepted value of 0.90 with p-value (0.000). There were no cross-loadings in the overall measurement model. Collectively, these results show the overall measurement model has a good fit and construct validity. Figure 5.14 presents the CFA output for the measurement model.

$$\chi^2 = 1246.041, df = 692; \chi^2 / df = 1.801; CFI = 0.913; GFI = 0.831; RMSEA = 0.052; RMR = 0.055; p = 0.000$$

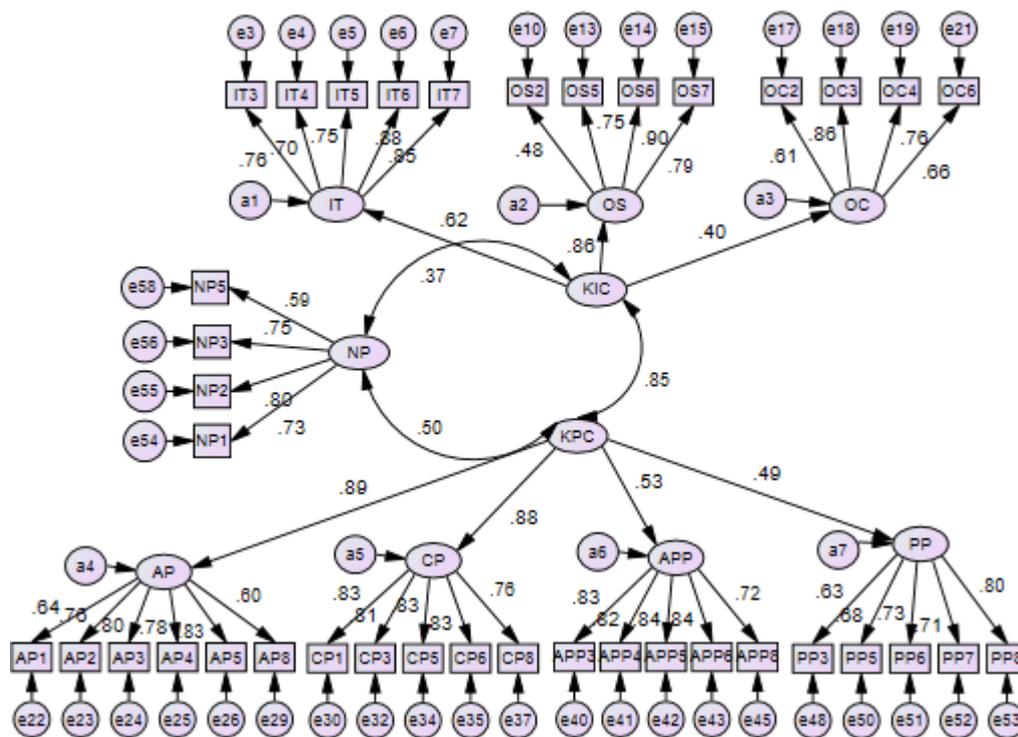


Figure 5.14: CFA Results for Final Measurement Model

Table 5.12a: Standardised Regression Weights (λ) and Composite Reliability Estimates (CR)

First order construct									
Items	IT	OS	OC	AP	CP	APP	PP	NP	t-value
IT3	0.76								12.235
IT4	0.70								12.235

First order construct									
Items	IT	OS	OC	AP	CP	APP	PP	NP	t-value
IT5	0.76								13.320
IT6	0.85								15.259
IT7	0.88								15.737
OS2		0.48							3.096
OS5		0.75							3.250
OS6		0.90							3.282
OS7		0.79							3.262
OC2			0.61						10.431
OC3			0.86						13.029
OC4			0.76						9.991
OC6			0.66						11.297
AP1				0.64					11.165
AP2				0.76					13.701
AP3				0.80					14.464
AP4				0.78					11.164
AP5				0.83					15.226
AP8				0.60					10.441
CP1					0.83				16.851
CP3					0.81				16.182
CP5					0.83				16.885
CP6					0.83				16.850
CP8					0.76				15.002
APP3						0.83			17.128
APP4						0.82			16.714
APP5						0.84			17.315
APP6						0.84			17.127
APP8						0.72			13.978
PP3							0.62		11.022
PP5							0.64		10.955
PP6							0.73		12.798

First order construct									
Items	IT	OS	OC	AP	CP	APP	PP	NP	t-value
PP7							0.75		13.591
PP8							0.80		14.085
NP1								0.73	11.738
NP2								0.80	11.738
NP3								0.75	11.331
NP5								0.59	9.119
CR	0.963	0.828	0.962	0.938	0.967	0.967	0.945	0.961	

Note: IT=Information Technology, OS=Organisational Structure OC =Organisational Culture, AP=Acquisition Process, CP=Conversion Process, APP=Application Process, PP=Protection Process, NP= Nursing care Performance

Table 5.12b: Standardised Regression Weights (λ) and Composite Reliability Estimates (CR)

Second order construct			
Items	KIC	KPC	t-value
IT	0.622		5.930
OS	0.861		3.071
OC	0.400		4.769
AP		0.890	9.721
CP		0.885	11.464
APP		0.532	7.752
PP		0.487	6.884
CR	0.965	0.960	

Note: KIC=Knowledge Infrastructure Capability, KPC=Knowledge Process Capability

Table 5.13: Standardised Regression Weights (λ) and Composite Reliability Estimates (CR)

Inter-Construct Correlation	Estimate	Standard error	t-value
KIC measurement model			
IT< ----- >OS	0.54	.037	2.897
IT< ----- >OC	0.24	.012	2.545
OS< ----- >OC	0.31	.026	3.317
KPC measurement model			
AP< ----- >CP	0.80	.035	7.868
AP< ----- >APP	0.42	.042	6.524
AP< ----- >PP	0.41	.036	3.844
CP< ----- >APP	0.49	.040	5.499
CP< ----- >PP	0.44	.026	5.488
APP< ----- >PP	0.28	.025	4.983
Overall measurement model			
KIC< ----- >KPC	0.85	.045	6.425
KIC< ----- >NP	0.37	.026	4.149
KPC< ----- >NP	0.50	.032	5.837

The next section explains the second step of the SEM; the specification of the structural model is to assess and examine the theoretical links among the unobserved variables.

5.3.5 Structural Equation Model

The independent latent variables in this study are knowledge infrastructure and knowledge process capabilities, while nursing care performance is the dependent latent variable. Knowledge infrastructure capability includes three different capabilities: information technology, organisational structure, and organisational culture, which are the observed variables. Knowledge process capability includes four different capabilities: acquisition, conversion, application, and protection, which are the observed variables. Therefore, SEM was deemed appropriate to address the research questions.

After the assessment of the validity of the measurement model, using the general six criteria: the chi-square, the chi-square divided by the degree of freedom (CMIN/DF), Goodness of Fit

Index (GFI), Comparative Fit Index (CFI), Root Mean Square Residual (RMR), and Root Mean Square Error of Approximation (RMSEA). The model was found to have a good-fit. Thus, the results were used to specify the structural model.

Nguyet (2010:168) citing Hair et al. (2006) indicated that the “fit statistics of the saturated model should be same as those obtained for the CFA model. The results of SEM showed that the structural model satisfied an acceptable level of model fit”. The overall CFA results for structural model were: $\chi^2 = 490.952$; $df = 271$; $CMIN/DF = 1.812$; $CFI = 0.946$; $GFI = 0.888$; $RMSEA = 0.052$; $RMR = 0.041$; $p = 0.000$. Overall, the findings conform to the literature, and thus give credence to the organisational capability theory by Gold et al. (2001). The findings are discussed more in detail in the evaluation of the research questions and hypotheses. Figure 5.15 displays the overall structural model fit.

$$\chi^2 = 490.952; df = 271; \chi^2 / df = 1.812; CFI = 0.946; GFI = 0.888; RMSEA = 0.052; RMR = 0.041; p = 0.000$$

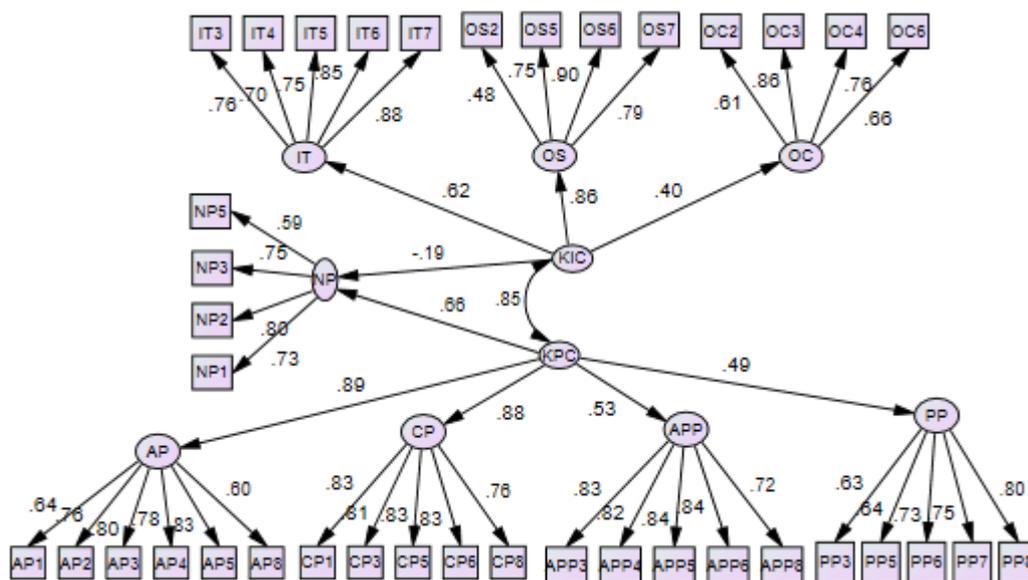


Figure 5.15: SEM Model

5.3.6 Result of the Research Questions and Hypotheses Test

Ten hypotheses (H₀₁ to H₀₁₀) were developed to deal with research questions one to three of this study. The hypotheses were examined by assessing the path coefficients and t-values. Knowledge infrastructure and process capabilities are the independent variables, while nursing

care performance is the dependent variable in the SEM model. The hypotheses were tested at 0.05 significant levels. Tables 5.14-5.16 display the results of the hypotheses test.

RQ1. What are the factors of KM capability influencing nursing care performance outcomes in selected health institutions in South-west Nigeria?

The first research question deals with the factors of knowledge management capability influencing nursing care performance outcomes in health institutions in South-west Nigeria. As stated in the preceding chapters, the identified factors of KM capability in the study are knowledge infrastructure and knowledge process capabilities. Knowledge infrastructure capability is identified by information technology, organisational structure, and organisational culture. Knowledge process capability is identified by acquisition, conversion, application and protection processes. To answer the research question, four hypotheses (H₀₁ to H₀₄) was developed to assess the relationship between the identified factors and nursing care performance. The hypotheses were tested by employing SEM as presented in Table 5.14. The result of the SEM shows that information technology and knowledge process significantly and positively influence nursing care performance in the selected health institutions. However, organisational structure and organisational culture did not significantly influence nursing care performance but the indirect influence of each factor on nursing care performance is found to be significantly positive. Therefore, the first research question in the study that focuses on the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria is addressed.

H₀₁: IT support does not have a positive influence on nursing care performance.

Hypothesis H₀₁ proposes that nursing care performance is not propelled by information technology. Results of SEM revealed that the path coefficient between technological infrastructure capability (IT) and nursing care performance was significant at 0.001. The estimated standardised value was 0.341, standard error estimated was 0.046 with associated t-value 4.919 and p-value (0.000) <0.001. In this aspect estimated standardised regression weight is positive with a significant level of p<0.001; hence, null hypothesis H₀₁ was rejected and a conclusion that information technology (IT) has significant and positive influence on nursing care performance was reached.

H₀₂: Organisational culture does not have a positive influence on nursing care performance.

Hypothesis H₀₂ proposes that nursing care performance is not propelled by organisational culture. The results of SEM revealed that the standardised regression weight of the structural path between structural infrastructure (OC) and nursing care performance was positive and statistically insignificant. The estimate standardised value was 0.059, standard error was 0.085, t-value was 1.038, while the observed p-value was (0.299) > 0.05. In this case the estimated standardised value is positive with an insignificant p-value. Based on this result, the researcher fails to reject the null hypothesis, since p-value is greater than 0.05 level of significance (p>0.05). It was therefore concluded that organisation culture does not have a significant positive influence on nursing care performance. However, in H₁₀, it was found to have an indirect influence through knowledge process with path coefficient=0.464.

H₀₃: Organisational structure does not have a positive influence on nursing care performance.

Hypothesis H₀₃ proposes that nursing care performance is not propelled by organisational structure. The results of SEM revealed that the standardised regression weight of the structural path between structural infrastructure (OS) and nursing care performance was positive and not statistically significant. The estimated standardised value was 0.062, standard error was 0.090, t-value was 0.960, while the observed p-value is (0.337) > 0.05. In this case, the estimated standardised value is positive with an insignificant p-value. Based on this result, the researcher fails to reject the null hypothesis, since p-value is >0.05. It was therefore concluded that organisation structure does not have a significant and positive influence on nursing care performance. However, in H₀₉, it was found to have an indirect influence through knowledge process with a path coefficient=0.576.

H₀₄: Knowledge Process capability does not have a positive influence on nursing care performance.

Hypothesis H₀₄ proposes that nursing care performance is not propelled by knowledge process capability. The SEM output revealed that the standardised regression weight of the structural path between knowledge process capability and nursing care performance was positive and

significant. The estimated standardised value was 0.0652, standard error was 0.170, t-value was 3.330 and p-value was $0.000 < 0.01$. The results indicated that knowledge process capability positively and significantly influence nursing care performance in the selected health institutions. Hence, the null hypothesis was rejected. In addition, organisational culture and organisational structure displayed insignificant effects on nursing care performance (the squared multiple correlation $R^2=0.106$).

Table 5.14: Result of Hypotheses H01 -H04

Hypothesis	Inter-Construct Correlation	Estimate	Standard error	t-value	p-value
H01	IT ----- >NP	0.341	0.046	4.919	P (0.000) <0.05
H02	OC ----- >NP	0.059	0.085	1.038	P (0.299)>0.05
H03	OS ----- >NP	0.062	0.090	0.960	P (0.337)>0.05
H04	KPC ----- >NP	0.652	0.170	3.330	P (0.000) <0.05

$R = 0.325$, $R^2= 0.106$. Note IT=Information Technology, OC =Organisational Culture, OS=Organisational Structure, KPC= Knowledge Process Capability, NP= Nursing care Performance.

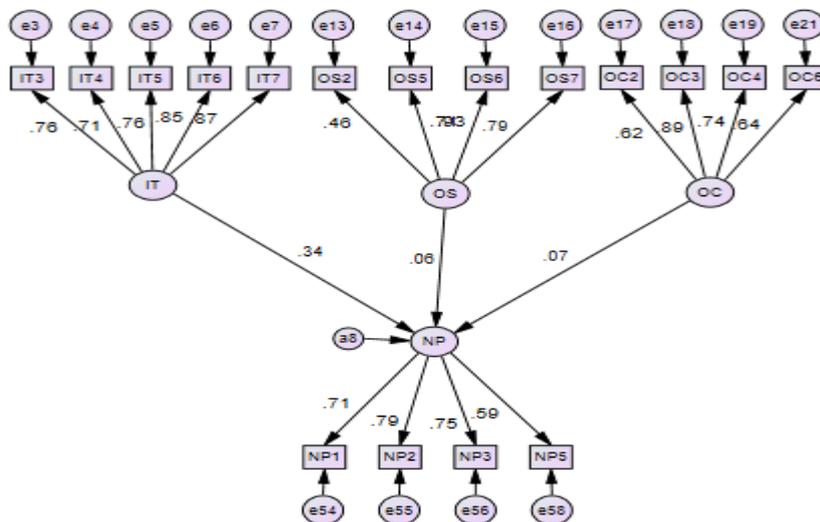


Figure 5.16: Relationship between individual (IT, OS, OC) on NP

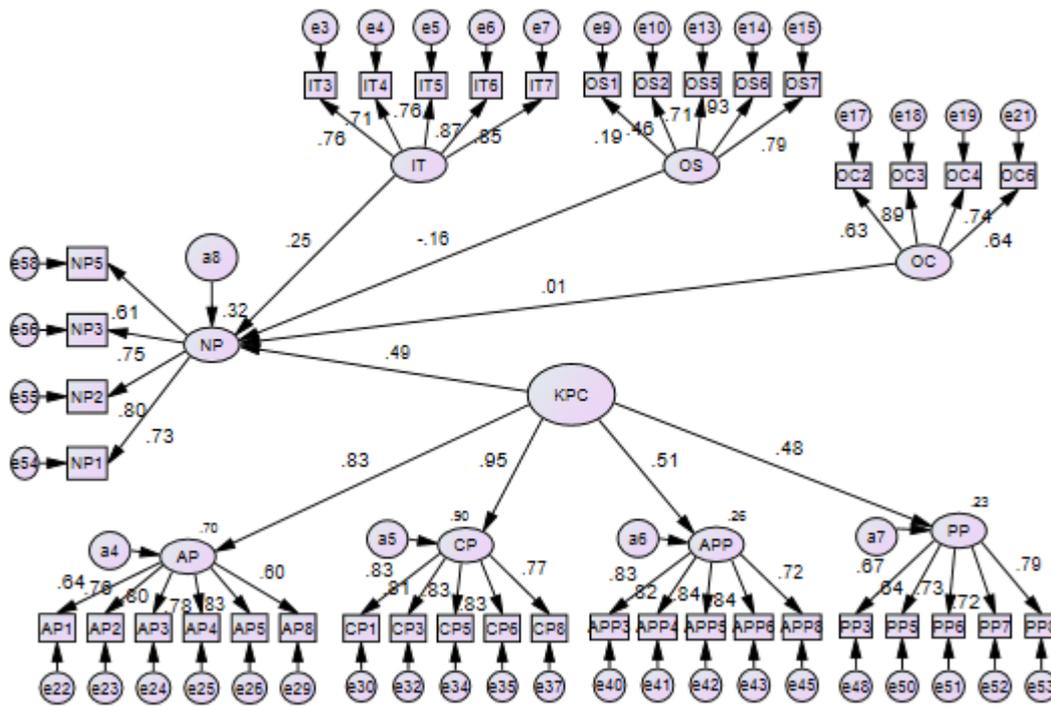


Figure 5.17: Relationship between KPC and NP

RQ2. What relationship exists between the aspects of knowledge infrastructure and knowledge process in KM capability in health institutions in South-west Nigeria?

To deal with this research question, three hypotheses (H₀₅ to H₀₇) were developed to assess the relationship between knowledge infrastructure and knowledge process in KM capability. Knowledge infrastructure capability is identified by information technology, organisational structure, and organisational culture. SEM was employed to test these hypotheses through path analysis as displayed in Table 5.15.

The result of the SEM shows that aspects of knowledge infrastructure-information technology, organisational structure, and organisational culture are significantly and positively correlated to knowledge process in KM capability. Thus, the second research question relating to the relationship that exists between the aspects of knowledge infrastructure and knowledge process in KM capability in the selected health institutions in South-west Nigeria is addressed.

H₀₅: IT is not positively related to knowledge process in KM capability.

Hypothesis H₀₅ proposes that technological infrastructure capability is not positively related to knowledge process in knowledge management capability. The SEM output indicated that the standardised regression weight of the structural path between information technology and knowledge process capability was positive and significant (IT↔KPC). The estimated standardised value was 0.203, standard error was 0.030, t-value was 3.467 and p-value was 0.000<0.01. Based on the result in figure 5.15, it was evident that there is a positive but weak relationship between information technology (IT) and KPC because the correlation coefficient computed (0.20) is less than 0.50; these results signified that correlation between IT and KPC is significant to be part of KMC measurement items. Thus, the null hypothesis H₀₅ was rejected.

H₀₆: Organisational structure is not positively related to knowledge process in KM capability.

Hypothesis H₀₆ proposes that organisational structure is not positively related to knowledge process in knowledge management capability. The results of SEM showed that the standardised regression weight of the structural path between, organisational structure and knowledge process capability was positive and significant (OS↔KPC). The estimated standardised value was 0.648, standard error was 0.028, t-value was 5.693 and p-value was 0.000<0.001. This result was significant at a level of 0.001 and indicated that there is a very strong and positive significant correlation between OS and KPC, but the state of significance did not result in multi-collinearity. These results provide the evidence that organisational structure and knowledge process is positively related. Thus, the null hypothesis H₀₆ was rejected.

H₀₇: Organisational culture is not positively related to knowledge process in KM capability.

Hypothesis H₀₇ proposes that organisational culture is not positively related to knowledge process in knowledge management capability. The results of SEM indicated that the standardised regression weight of the structural path between organisational culture capability and knowledge process in KM capability was significantly positive (OC↔KPC). The estimated standardised value was 0.187, standard error was 0.016, t-value was 3.093 and p-value was 0.002<0.01 (see Table 5.15). This connotes that organisational culture is weakly and positively

correlated to knowledge process capability. These results provide the evidence that organisational structure and knowledge process is positively related. Thus, the null hypothesis H₀₇ was rejected at a 0.001 level of significance.

Table 5.15: Parameter Estimates of H₀₅ -H₀₇

Hypothesis	Inter-Construct Correlation	Estimate	Standard error	t-value	p-value
H ₀₅	IT< ----- >KPC	0.203	0.030	3.467	P(0.000)<0.001
H ₀₆	OS<----- >KPC	0.648	0.028	5.693	P(0.000)<0.001
H ₀₇	OC< ----- >KPC	0.187	0.016	3.093	P(0.002)<0.01

The relationship between IT, OS and OC are showed in Figure 5.18.

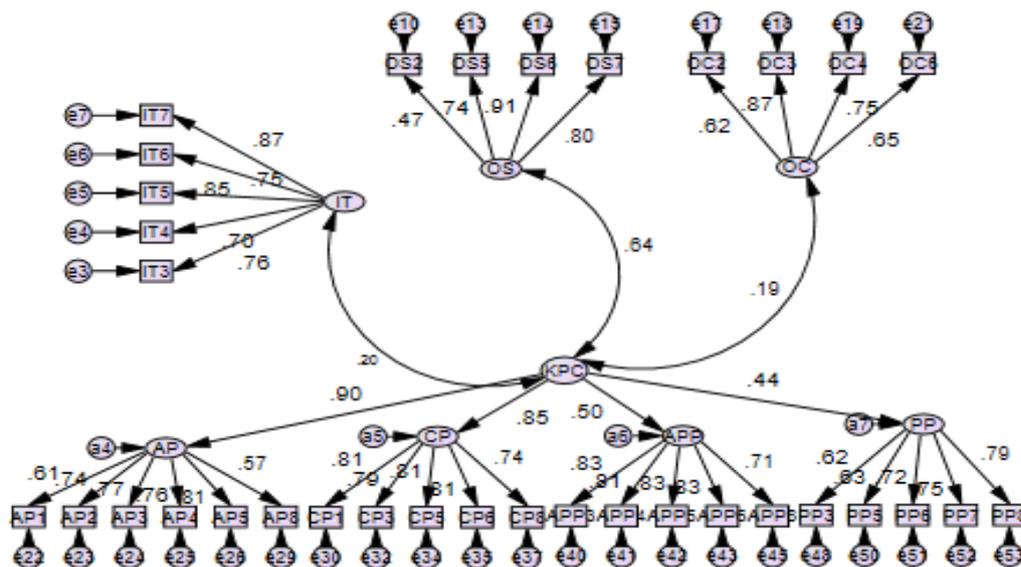


Figure 5.18: Relationship between individual (IT, OS, OC) and KPC

RQ 3. How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability influence nursing care performance in health institutions in South-west Nigeria?

To deal with this research question, three hypotheses (H₀₇ to H₀₁₀) were developed to assess how the relationship that exists between the aspects of knowledge infrastructure and knowledge process in KM capability affect nursing care performance in health institutions in South-west Nigeria. Knowledge infrastructure capability is identified by information technology,

organisational structure, and organisational culture. The hypotheses were tested using SEM through path coefficient as presented in Table 5.16. The result of the SEM shows that the relationship between the aspects of knowledge infrastructure and knowledge process significantly and positively influences nursing care performance. Therefore, the third research question concerning the influence of the relationship that exists between the aspects of knowledge infrastructure and knowledge process in KM capability on nursing care performance in the selected health institutions in South-west Nigeria is addressed.

H₀₈: The relationship between IT support and knowledge process in KM capability does not positively influence nursing care performance.

This hypothesis suggests that the relationship between technological infrastructure and knowledge process is not a positive predictor of nursing care performance. The SEM output revealed that the standardised regression weight of the path coefficient between the two exogenous constructs (technological infrastructure and knowledge process) and endogenous construct (nursing care performance) was positive and significant (IT < ---- > KPC < ---- > NP standardised value=0.132, standard error =0.040, t-value=3.312 and p-value= 0.000<0.01). These results provide strong evidence that the connection between the technological infrastructure capability and knowledge process positively influence nursing care performance. Thus, the null hypothesis H₀₈ was rejected.

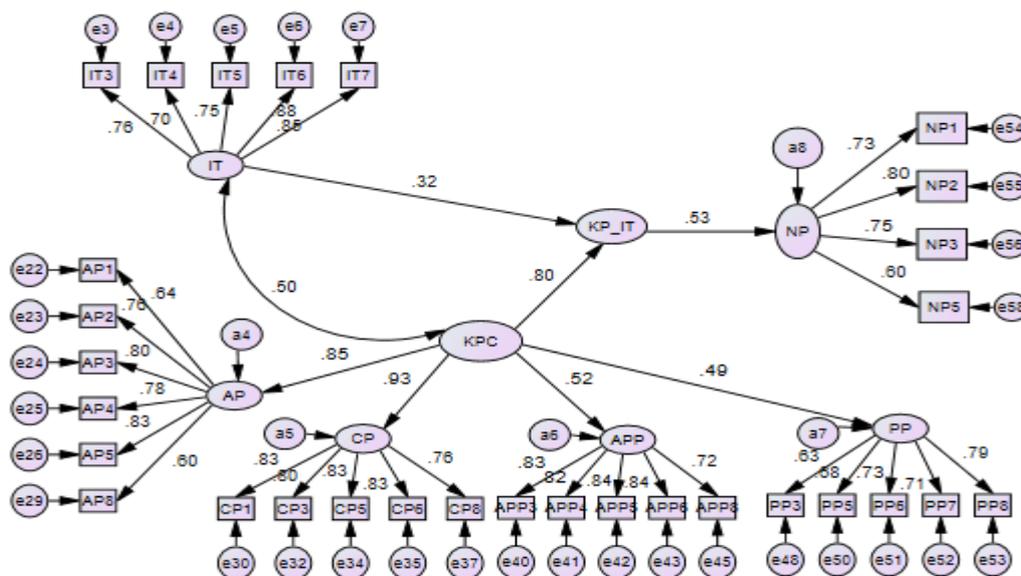


Figure 5.19: Relationship between IT and KPC on NP

H₀₉: The relationship between organisational structure and knowledge process in KM capability does not positively influence nursing care performance.

This hypothesis suggests that the relationship between structural infrastructure and knowledge process is not a positive predictor of nursing care performance. SEM results indicated that the standardised regression weight of the structural path between the two exogenous constructs (organisational structure and knowledge process capability) and endogenous construct (nursing care performance) was positive and significant (OS \rightarrow KPC \rightarrow NP path coefficient = 0.576, standard error = 0.105, t-value = 5.484 and p-value = 0.000 < 0.01). These results provide strong evidence that the connection between organisational structure and knowledge process positively and strongly influence nursing care performance. Thus, the null hypothesis H₀₉ was rejected.

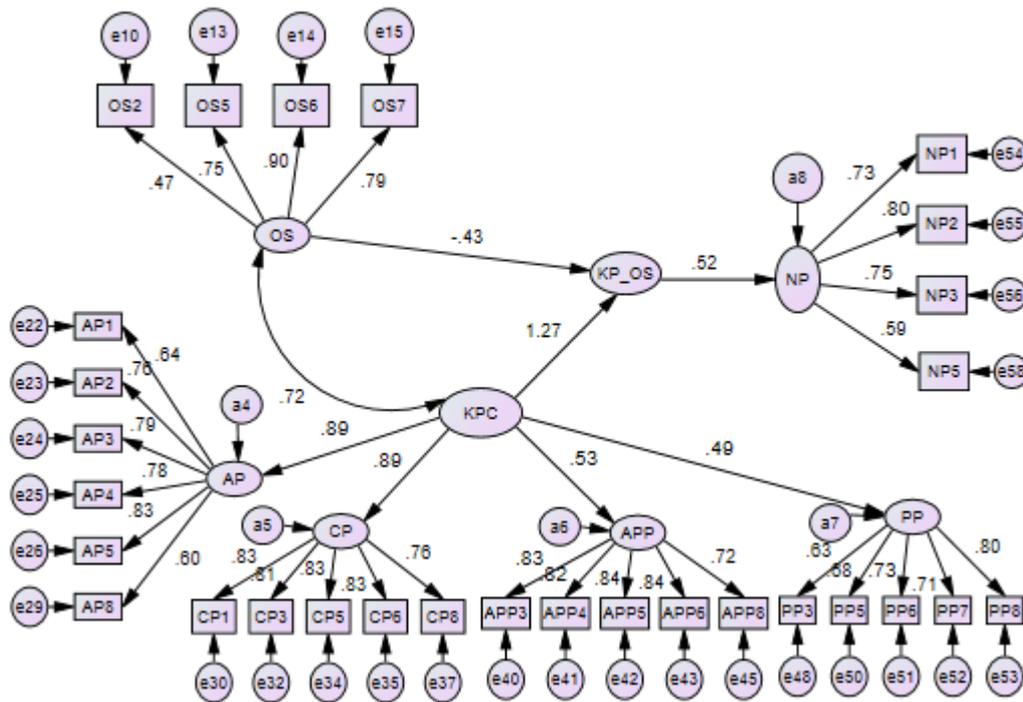


Figure 5.20: Relationship between OS and KPC on NP

H₀₁₀: The relationship between organisational culture and knowledge process in KM capability does not positively influence nursing care performance.

This hypothesis suggests that the relationship between organisational culture and knowledge process is not a positive predictor of nursing care performance. The results of SEM showed that the standardised regression weight of the structural path between the two exogenous

constructs (cultural infrastructure and knowledge process capability) and endogenous construct (nursing care performance) was positive and significant (OC < ---- > KPC < ---- > NP path coefficient = 0.464, standard error = 0.074, t-value = 6.271 and p-value = 0.000 < 0.01). These results suggest that the relationship between the organisational culture and knowledge process positively influence nursing care performance. Thus, the null hypothesis H₀₁₀ was rejected.

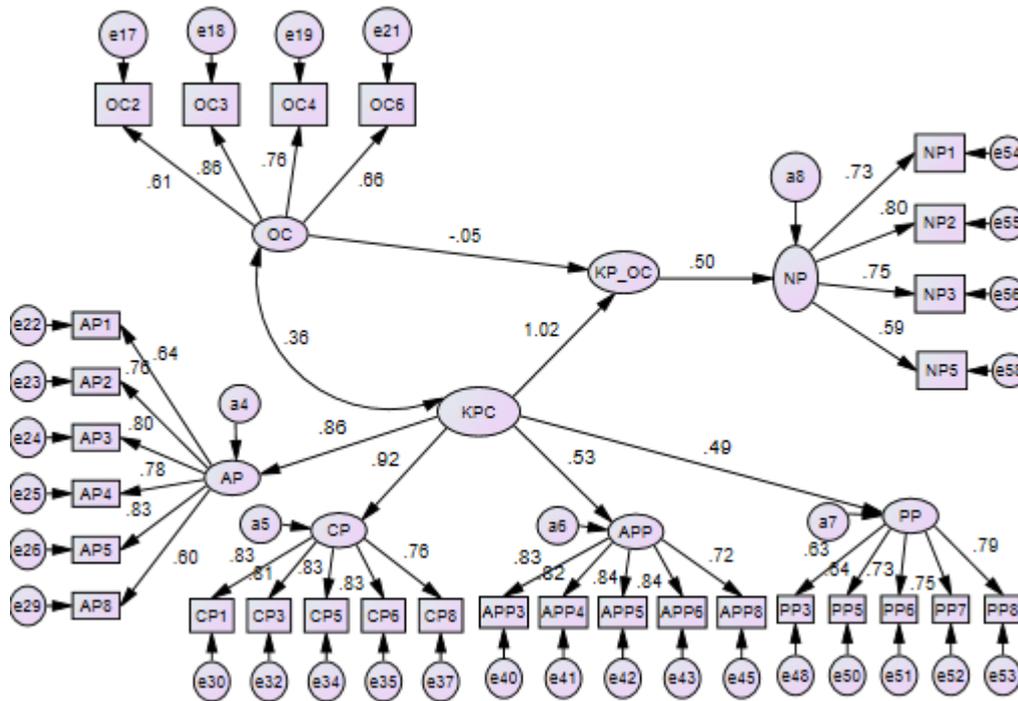


Figure 5.21: Relationship between OC and KPC on NP

Table 5.16: Parameter Estimates of H₀₈ -H₁₀

Hypothesis	Inter-Construct Correlation	Estimate	Standard error	t-value	p-value
H ₀₈	IT < ---- > KPC < ---- > NP	0.132	0.040	3.312	P(0.000) < 0.001
H ₀₉	OS < ---- > KPC < ---- > NP	0.576	0.105	5.484	P(0.000) < 0.001
H ₁₀	OC < ---- > KPC < ---- > NP	0.464	0.074	6.271	P(0.000) < 0.001

Table 5.17 displays the summary of the results of hypotheses tests

Table 5.17: Summary of the result of hypotheses Test

Research question	Hypothesis	Finding	Conclusion
1. What are the factors of KM capability (infrastructure and process) influencing nursing care performance outcomes in health institutions in South-west Nigeria?	H ₀₁ . IT support does not have a positive influence on nursing care performance.	P<0.05	Rejected
	H ₀₂ . Organisational culture does not have a positive influence on nursing care performance.	P>0.05*	Supported
	H ₀₃ . Organisational structure does not have a positive influence on nursing care performance.	P>0.05*	Supported
	H ₀₄ . Knowledge Process capability does not have a positive influence on nursing care performance.	P<0.05	Rejected
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?	H ₀₅ . IT is not positively related to knowledge process in KM capability.	P<0.05	Rejected

	H ₀₆ . Organisational structure is not positively related to knowledge process in KM capability.	P<0.05	Rejected
	H ₀₇ . Organisational culture is not positively related to knowledge process in KM capability.	P<0.05	Rejected
3.How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?	H ₀₈ . The relationship between IT support and knowledge process in KM capability does not positively influence nursing care performance.	P<0.05	Rejected
	H ₀₉ . The relationship between organisational structure and knowledge process in KM capability does not positively influence nursing care performance.	P<0.05	Rejected
	H ₀₁₀ . The relationship between organisational culture and knowledge process in KM capability does not positively influence nursing care performance.	P<0.05	Rejected

5.4 Qualitative findings

As highlighted in Chapter four of this study, mixed methods design was employed for the collection of quantitative and qualitative data. Although the quantitative method was predominant, the qualitative method was used as a complementary method to get a deeper understanding of the quantitative findings.

The qualitative data collection stage of this study involved the purposive sampling in selecting the Deputy Director of Nursing Services (DDNS) from the selected teaching hospitals and census method to gather the required data. The data collected was analysed by using content

analysis. This phase of data collection was employed to address the fourth research question addressed in the study:

- How can knowledge management capability be leveraged to support nursing care performance?

The purposive sampling was chosen “due to informational considerations and to maximize the information” (Lincoln and Guba, 1985:202). The rationale for the choice of the DDNS for interviews is based on Davenport and Prusak (1998) who indicated that people’s experience will provide a perspective from which they view and understand situations and events.

A total of 14 respondents were contacted for the interview session, however the researcher managed to conduct the interviews with only 9 respondents. This resulted in the response rate of 64.3%. The total time taken for each respondent was 55 minutes. The interviews were conducted from October 2 to December 18.

The interview was prepared and conducted in English. The interview guide is provided in Appendix 2. All interviews were recorded upon participants permission and notes were also taken and the respondents were given a unique identifier.

Table 5.18 shows the alignment of research questions and interview questions.

Table 5.18: Alignment of research questions and interview questions

Research questions	Factors of interest	Interview questions
How can knowledge management capability be leveraged to support nursing care performance?	<i>Information technology</i>	Do you have policies guiding IT support in nursing care by your health institution?
		What are the types of IT support available for nurses?
		To what extent has your health institution provided training for nurses in the use of IT tools?
		What are the problems associated with the use of IT by the nurses?

Research questions	Factors of interest	Interview questions
		How do you think such problems can be resolved?
	<i>Organisational culture</i>	How does the organisational culture support knowledge management in nursing care in terms of professional training and organisational learning?
		What is your perception about senior management support of knowledge management practices in nursing care?
		What are the barriers created by the organisational culture in providing efficient nursing care?
		How can the barriers to effective knowledge management created by the organisational culture be surmounted?
	<i>Organisational structure</i>	Does the existing structure support trust mechanisms in knowledge transfer among nurses across the units in the teaching hospital?
		How does the organisation coordinate the efforts of different units in providing patient care?
		How does the organisational structure support collaboration and knowledge sharing among the nurses across the units in providing quality patient care?

Research questions	Factors of interest	Interview questions
		What constraints does the organisational structure have on effective knowledge management practices in nursing care?
	<i>Knowledge process</i>	Please describe the processes involved in acquiring, converting, applying and protecting knowledge by the registered nurses in your health institution?
		What are the problems associated with knowledge process activities in patient care among the nurses?
		In general, what are the main challenges experienced by the nurses in caring for patients?
		Do have knowledge management policy in your health institution?

5.4.1 Demographic characteristics of the respondents

The respondents were asked about their qualifications, years of work experience, designation, and name of their hospital respectively.

Table 5.19: Demographic characteristics of the respondents

Respondent	Qualification	Years of Work experience	Name of teaching hospital	Designation
A	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	30	OAUTHC	DDNS

Respondent	Qualification	Years of Work experience	Name of teaching hospital	Designation
B	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	25	OAUTHC	DDNS
C	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	27	OAUTHC	DDNS
D	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	32	OAUTHC	DDNS
E	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc) Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	29	UCH	DDNS
F	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	27	UCH	DDNS
G	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	31	UCH	DDNS
H	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	24	UCH	DDNS
I	Registered Nurses (RNs), Bachelor of Nursing Sciences (BNsc)	29	UCH	DDNS

5.4.2 Leveraging Information Technology to support Nursing care

Questions were asked to investigate how technological infrastructure utilised by the registered nurses can be leveraged to support nursing care.

5.4.2.1 Do you have policies guiding IT support in nursing care by your health institution?

This question sought to know the policies guiding IT support in nursing care.

Table 5.20: Policies guiding IT support in clinical processes

OAUTHC	<ul style="list-style-type: none"> • There are polices but not functional. The hospital is still in the process of implementation of IT support • There is a proposal for the policy but not yet effective
UCH	<ul style="list-style-type: none"> • We have policies guiding IT but it has not been implemented • There are policies, nurses were trained and computers were installed but it is not functional

5.4.2.2 What are the types of IT tools and support available for nurses in patient care?

This question established the types of IT support tools available for nurses in patient care.

Table 5.21: IT support tools available for nurses in patient care

OAUTHC	<ul style="list-style-type: none"> • It is only the medical record has IT support tools to retrieve patient records. For now, apart from the laptop we bought with our money, there are no IT support • Computers are only installed in some wards which is not working and we still document our reports manually.
UCH	<ul style="list-style-type: none"> • Our form of IT support is through Whatsapp and CUG. • There is hospital information system and it is only head of units that have access to it • The IT support we have are outdated computers, we still use paper documentation.

5.4.2.3 To what extent has your health institution provided training for nurses in the use of IT tools?

This question sought to know the extent the two health institutions have provided training for registered nurses in the use of IT tools.

Table 5.22: Extent of training for nurses in the use of IT tools by health institutions

OAUTHC	<ul style="list-style-type: none"> Initially nurses were trained and sponsored but now corruption has destroyed everything. Nurses take distance learning courses in the use of computers which they pay for. the computer skills are used for promotion.
UCH	<ul style="list-style-type: none"> The management provides IT training in the use of computers Nurses are sent for training and it is also used for promotion. the hospital has been doing that for the past 10 years.

5.4.2.4 What are the problems associated with the use of IT by the nurses?

This question aimed at identifying the problems associated with the use of IT by the nurses.

Table 5.23: Problems associated with IT use by nurses

OAUTHC	<ul style="list-style-type: none"> IT tools have not been implemented for nurses. We have computers that are no more functional.
UCH	<ul style="list-style-type: none"> There is no functional use of IT tools by nurses although the doctors are increasingly using IT communication tools in some units which was implemented by the government

5.4.2.5 How do you think such problems can be resolved?

This question aimed to identify strategies to resolve the identified problems associated with the use of IT by the nurses.

Table 5.24: Ways of resolving problems of IT use

OAUTHC	<ul style="list-style-type: none"> • The Federal Government needs to build up ICT infrastructure in the hospital like they have in the developed countries • We need a functional IT policy that will include nurses. Nurses are marginalised.
UCH	<ul style="list-style-type: none"> • The hospital management needs support from the federal government and the ministry of health in implementing ICT support. • The hospital management needs to employ well trained IT support staff.

5.4.3 Leveraging Organisational Culture to support Nursing care

Questions were asked in order to ascertain how organisational culture in KM capability can be leveraged to support nursing care.

5.4.3.1 How does the organisational culture support knowledge management in nursing care in terms of professional training and organisational learning?

The question sought to know how the organisational culture support knowledge management in nursing care in terms of professional training and organisational learning.

Table 5.25: Organisational culture support for professional training and organisational learning

OAUTHC	<ul style="list-style-type: none"> • The culture is very supportive. In clinical nursing we have in service education every year structures in a way that the loopholes are corrected, and new trend of care inputted. Then we have a mandatory professional symposium/ seminar nurses must attend before their licenses are renewed. Periodic lectures that cut across all professions are organised. Also workshop for diseases and treatments are organised. • The culture supports nurses to a great extent. There are in-training. registered nurses are the baseline so they are trained so that they can be redeployed. The nurses learn
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	<p>from experience. We hold seminars on for all unit level during deployment specialist nurses are deployed to their area of specialisation. In different clinical units to enhance effectiveness and efficiency. Yearly orientation is done in order to remove fatigue and boredom. Nurses are rotated to promote productivity.</p>
UCH	<ul style="list-style-type: none"> • We have yearly continuing education programs, seminars, workshops, conferences which are sponsored. Specialised training for nurses are also available • There are continuing education programme for all cadre of nurses. • There are lots of seminars being organised and sponsored. Each department also sponsor their nurses.

5.4.3.2 What is your perception about senior management support of knowledge management practices in nursing care?

The question sought to know perceptions about senior management support of knowledge management practices in nursing care.

Table 5.26: Senior management support of KM

OAUTHC	<ul style="list-style-type: none"> • They are trying hard by ensuring periodic training for nurses and organisational learning and innovations in healthcare. • The management is doing well and trying hard to see all is functioning well for effective and efficient patient care.
UCH	<ul style="list-style-type: none"> • Senior management support promotion, incentives and sponsorship to workshops and seminars. • There is full support from the management.

5.4.3.3 What are the barriers created by the organisational culture in providing efficient nursing care?

This question sought to identify the barriers created by the organisational culture in providing efficient nursing care.

Table 5.27: Barriers created by organisational culture

OAUTHC	<ul style="list-style-type: none"> • The management is trying their best.
UCH	<ul style="list-style-type: none"> • No barriers. • The organisational culture supports nursing care.

5.4.4 Leveraging Organisational Structure to support Nursing care

5.4.4.1 Does the existing structure support trust mechanisms in knowledge transfer among nurses across units in the teaching hospital?

This question aimed to identify the existing structure support trust mechanisms in knowledge transfer among nurses across the units in the teaching hospital.

Table 5.28: Organisational structure support for knowledge transfer

OAUTHC	<ul style="list-style-type: none"> • There is trust in terms of patient care and it is part of our ethics to keep secrets. We are the advocate of the patient. • There is a medium through which information is disseminated at the unit level. There is a meeting on Mondays where information is disseminated which is anchored by the DDNS to the ward levels down to the nursing officers 1. • There is confidentiality in nursing. Keeping patients secret is mandatory.
UCH	<ul style="list-style-type: none"> • The trust mechanisms are not there because of discussions to outsiders. Information is divulged despite that we signed oath of secrecy. • Patient information are treated as confidential, relevant health workers disclose information about patients to each other. Information is not divulged anyhow. • There is trust mechanism on the scale of 75%.

5.4.4.2 How does the organisation coordinate the efforts of different units in providing patient care?

This question sought to know how the organisation coordinates the efforts of different units in providing patient care.

Table 5.29: Coordination of clinical units in providing patient care?

OAUTHC	<ul style="list-style-type: none"> • We have clinical nursing report. During hand over, all ward leaders come to the HOD’s office to give report to the DDNS. • The annual performance evaluation is used by the management to assess the nurses in all units and departments. • We have rating of annual performance evaluation report where performance of nurses is inputted. Metrics include relation with patients and coworkers and ability to discharge duties effectively.
UCH	<ul style="list-style-type: none"> • The central management with the chief medical director coordinate the units. Also in clinical nursing, nurses hand over to each other and there is a clockwise coordination. DDNS hand over to CMAC and report the history of patients and nurses under their leadership. • We are expected to give care based on rules and procedures. Nurses are expected to take decisions for patient care. Different units take care of the patients as relevant as possible. • We have performance indicators which includes monthly metric rating of turnover of patients admitted.

5.4.4.3 How does the organisational structure support collaboration and knowledge sharing among the nurses across the units in providing quality patient care?

This question was asked to know how the organisational structure support collaboration and knowledge sharing among the nurses across the units in providing quality patient care.

Table 5.30: Organisational support of collaboration and knowledge sharing

OAUTHC	<ul style="list-style-type: none"> • Effective collaboration in providing quality care. Constructive criticisms and cross fertilization of ideas, consensus is reached. • Policies and directives is not contestable.
UCH	<ul style="list-style-type: none"> • There is collaboration during training and workshop. • There is management training organised each year where nurses from other departments collaborate to share knowledge

5.4.4.4 What constraints does the organisational structure have on effective knowledge management practices in nursing care?

This question was asked to investigate the restrictions caused by the organisational structure have on effective knowledge management practices among the registered nurses in the selected teaching hospitals.

Table 5.31: Constraints caused by Organisational structure

OAUTHC	<ul style="list-style-type: none"> • There is no constraint • The reporting relationships supports the nurses in terms patient care, however the centralisation hinders supplies of material on time.
UCH	<ul style="list-style-type: none"> • The organisational structure supports the nurses in terms of hierarchy of reporting relationships

5.4.4 Leveraging Knowledge Processes to support Nursing care

5.4.5.1 Please describe the processes involved in acquiring, converting, applying, and protecting knowledge by the registered nurses in your health institution?

This question sought to know the knowledge process utilised by the nurses in the two health institutions.

Table 5.32: Knowledge processes in nursing care

<p>OAUTHC</p>	<ul style="list-style-type: none"> • The nursing process is the knowledge process in our practice. We have assessment, diagnosis, planning, implementation and evaluation. Assessment involves making the patient comfortable and medical history is taken. Planning involves checking the nursing care plan, things needed for care, who are those involved and equipment to be used. Implementation is following through the nursing care plan. In evaluation, you check if the goals of care are achieved and if the patient is better than before. Diagnosis is checking the patients, what are the objectives and incase the objectives are not achieved, you reassess. • The nursing process involves documentation of care given. the documentation is kept in the health record. • We do ward rounds for the patients on admission at all clinical wards.
<p>UCH</p>	<ul style="list-style-type: none"> • We use the nursing process and there is a policy and rule in place. • The nursing process involves the assessing, diagnosing, planning, implementing and evaluating phases. • The nurse in charge gathers information about the patient’s health and analyzes the information and identifies problems where patient outcomes can be improved through the use of nursing interventions. Planning involves the nursing care plan. Can this case be managed, can we refer, which consultant, which specialty should the patient be referred to? Does it involve admission? Then the nursing care plan is implemented. Finally, evaluation by finding out if what you have done is okay. If the approach is not effective, reassessment is done.

	<ul style="list-style-type: none"> • We have the nursing process booklet which doesn't leave the unit after discharge, it is attached to the case note. Even the patient cannot handle the case note. • Ward rounds also take place every morning in which ward leaders and medical doctors assess the patients on admission.
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5.4.5.2 What are the problems associated with knowledge process activities in patient care among the nurses?

This question sought to identify the problems associated with knowledge process activities in patient care among the nurses.

Table 5.33: Problems associated with knowledge process activities in patient care

OAUTHC	<ul style="list-style-type: none"> • The problem associated with the nursing process in providing patient care is the shortage of skills, lack of manpower, resource scarcity and inadequate time. When you come to the ward, you will see there are many patients to few nurses. The use of nursing process is time consuming; there are lot of things to be done. • We don't have the freedom to make clinical judgment and decision except the doctors. • Shortage of manpower and equipment's are not available to perform nursing care. We have outdated equipment. • There is no motivation also to apply the nursing process
UCH	<ul style="list-style-type: none"> • Lack of organisational support in having the authority to make decisions. we work in a stressful environment with decapitated infrastructure. This makes it difficult at times to use the nursing process. • There is no consistent supply of consumables and materials to use the nursing process. • The patients are more than we can cater for. using a nursing process for each patient is cumbersome, how many patients

	<p>can a nurse plan a care for at the end of the day when a nurse attends to 20 patients with just assistant.. we end up getting tired but we try our best.</p> <ul style="list-style-type: none"> • There is lack of electronic documentation.
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5.4.5.3 How do you think such problems can be resolved?

This question sought to identify the strategies in resolving the problems associated with knowledge process activities in patient care among the nurses.

Table 5.34: Resolving problems associated with knowledge processes in nursing care

OAUTHC	<ul style="list-style-type: none"> • The management should ensure the care plan and resources needed by the nurses are regularly provided. More nurses should be employed and equipped them with the needed skills and confidence to value the nursing process
UCH	<ul style="list-style-type: none"> • More training is needed for its application by the nurses.

5.4.5.4 In general, what are the main challenges experienced by the nurses in caring for patients?

This question sought to identify the main challenges experienced by the nurses in caring for patients.

Table 5.35: Challenges experienced by the nurses in caring for patients

OAUTHC	<ul style="list-style-type: none"> • Power failure, exposure of nurses to diseases, bad structure and self-development for each nurse. Excellent training, improvement of care by providing resources. Nursing and midwifery council can help. • Shortage of staff, obsolete equipment, inadequate resource and consumables. • Corruption, budget for healthcare is minimal, erratic electricity, lack of finances. • Inability of the patients to foot the expenses incurred for their healthcare. In some cases, they abscond. Harassment
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	of nurses by the relatives. We also have shortage of manpower and un supportive government
UCH	<ul style="list-style-type: none"> • Lack of consumables, supplies, finances, fund and erratic electricity and water supply. • We suffer from inadequacies of materials and equipment to work it. Management are trying but we cannot meet the needs as expected. Economy is in bad shape and affecting the healthcare sector • Brain drain is happening. In 2014 50% out of the nurses employed have resigned and travelled out of the country • Provision of resources, consumables to work with, equipment of the hospital, good salary, staff welfare and good working conditions

5.4.5.5 What solutions do you proffer to the challenges experienced by the nurses in caring for patients?

This question sought to identify the strategies in resolving the challenges experienced by the nurses in caring for patients.

Table 5 36: Resolving the challenges experienced in nursing care

OAUTHC	<ul style="list-style-type: none"> • Federal Government should provide the needs of the hospitals and make the environment conducive for nurses and patients. Nurses improvise most times. • Senior management should liaise with the government to attend to pertinent issues. • Manual procedures are still being used, it needs to be computerized
UCH	<ul style="list-style-type: none"> • Government should provide materials and funds. There is high level of poverty among the people. • Provision of modern equipment, employment of more nurses.

5.4.5.6 Do you have knowledge management policy in your health institution?

This question sought to investigate the knowledge management policy available in the two health institutions.

Table 5.37: Knowledge management policy available

OAUTHC	<ul style="list-style-type: none"> • There is no knowledge management policy, but we have healthcare information systems policy implemented in 2014. • We don't have KM policy in the hospital but we follow the directives from the hospital management and federal ministry of health.
UCH	<ul style="list-style-type: none"> • No policy on knowledge management is available. Health policy allocated to information management is bad • I am aware of health information management. There is electronic health record in place, however there are still certain challenges affecting its continuous use fore overall success

5.5 Summary of findings

This chapter presented the data collected using questionnaire and semi-structured interviews. The chapter was organised around the introduction, response rate, and demographic characteristics of the respondents that covered gender, age, highest qualification, and total years of work experience. Other demographic information of the respondents covered clinical units, and job title/designation in the teaching hospitals. The majority of the respondents were females and fall within the age range of 26-35. There were differences in terms of total years of work experience, it was noted that majority of the registered nurses from the two teaching hospitals had spent between 1-5 years on the job. For the highest academic qualification of these registered nurses, findings revealed that majority possess registered nurses certificate. In terms of job title/ designation, majority of the registered nurses were a nursing officer 1. In addition, majority of the respondents were from an outpatient clinic.

The dual-process of SEM using AMOS statistical software version 22 was applied to analyse the quantitative data in addressing the research questions and hypotheses. Key findings from SEM showed that information technology infrastructure and knowledge management process capability significantly and directly influenced nursing care performance. However, organisational culture and organisational structure had no significant direct influence on nursing care performance. The findings also revealed that significant and positive relationship exists between the dimensions of knowledge infrastructure and knowledge process in KM capability. The result further revealed that the relationship between the dimensions of knowledge infrastructure and knowledge process in KM capability significantly and strongly influence nursing care performance.

The qualitative data obtained through semi-structured interviews was analysed by using content analysis. Findings on how KM capability can be leveraged to improve nursing care revealed the challenges affecting KM in the two teaching hospitals and solutions proffered.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1 Introduction

This chapter presents the discussion of findings on knowledge management capability in nursing care performance in selected teaching hospitals in South-west, Nigeria. The discussion of findings is based on the results of the data analysis presented in the previous chapter. Kothari (2004) asserts the importance of the interpretation of research findings, as an interaction between theoretical orientation and empirical observation that introduces originality and creativity into academic research. The chapter is organised around the research questions and where appropriate interpreted using extant empirical literature and theory that underpinned the study. The study sought to address the following research objectives:

1. To investigate the factors of KM capability affecting nursing care performance outcomes in health institutions in South-west Nigeria.
2. To investigate the relationship between knowledge infrastructure and knowledge process in KM capability on nursing care performance.
3. To examine how KM capability can be leveraged to support nursing care performance outcomes.

Based on the above research objectives, four corresponding research questions were investigated:

1. What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?
4. How can KM capability be leveraged to support nursing care performance?

Furthermore, hypotheses were developed and tested using structural models to address the questions. The next sections therefore present discussion of the findings.

6.2 Response Rate

The results presented in section 5.2 indicate that a good response rate of 93.13% was attained for quantitative data and 64.29% for qualitative data. This was largely because the assistant deputy directors in each clinical unit were responsible for introducing the researcher to the registered nurses and encouraged the respondents to complete the questionnaires. Furthermore, the field assistants helped to ensure the questionnaires were properly completed.

Babbie and Mouton (2003:261) stipulated that, “the overall rate of response is a guide to the representativeness of the sample of respondents. A response rate of 50 per cent is suitable, 60 per cent is good and 70 percent and above is very good for analysis and reporting of the findings”. Furthermore, Bailey (2008) emphasised that if a high response rate is achieved, there is less chance of significant response bias than in a low rate response. Thus, it may be specified that the interpretations made in this chapter and subsequent conclusions are reasonable.

6.3 Demographic characteristics of the respondents

In section 5.3, the importance of demographic characteristics of the respondents was highlighted. The results of the demographic characteristics in this study were presented in five subsections under the headings: gender, age, highest qualification, years of work experience, clinical units and job title/designation of respondents in the teaching hospitals.

The respondents consisted of registered nurses from seventeen clinical wards in University College Hospital (UCH) and Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Nigeria. A sum of 298 (93.13%) participated in the study. Of this, 186 (94.90%) were from UCH and 112 respondents (90.32%) from OAUTHC, Ile-Ife. The high number of respondents at UCH located in Ibadan may be attributed to the fact that the hospital has higher numbers of registered nurses compared to OAUTHC, Ile-Ife. At the same time, the UCH is the premier hospital in the country and it is a Federal Government-owned teaching hospital attached to the University of Ibadan and is a national leader in undergraduate and postgraduate medical education.

The results of gender distribution (subsection 5.3.1.1) showed that, females constituted the majority of respondents from the two teaching hospitals (235:78.9%) compared to males (63:21.1%). Evidence from this study reveals the dominance of female nurses in the surveyed

teaching hospitals. The dominance of females in nursing profession is well documented (Evans, 1997; Bagilhole and Cross, 2006; Marks, 2001; Lee, Kim and Kim, 2014; Akansel, 2008; Boateng, 2010; Folami, 2017; and Baro and Ebhomeya, 2013). Boateng (2015) investigated the career pathways, professional integration and live experiences of regulated nurses in Canada, 6 out of 66 nurses surveyed were males, and 60 were females. Lee, Kim and Kim (2014) in their study on relationships between core factors of KM in hospital nursing organisations and outcomes of nursing performance reported the nurses were predominantly females (95.8%).

Kalemba (2016) observes that females' preference for nursing profession was stronger than males due to the feminine nature of the females. This finding corroborates with Adebayo and Ilesanmi (2016) who in their study on collaboration between doctors and nurses in a tertiary health facility in South-west Nigeria found that the population of female nurses (225; 55.7%) surpassed that of their male counterparts (31; 7.7%). In a survey by Macphee et al. (2017) on the "impact of heavy perceived nurse workloads on patient and nurse outcomes", the majority (449; 95.9%) of the respondents were females compared to males (19; 4.1%).

With respect to age (subsection 5.3.1.2), it was established that, most of the registered nurses from the two teaching hospitals were between the age range of 31-35 years (63; 21.1%), closely followed by those within the range of 26-30 years (60, 20.1%). A considerable number of respondents also fall within the age range of 36-40 years (45, 15.1%) followed by those within the range of 41-45 (43, 14.4%). The least of the respondents were registered nurses whose ages were over 55 years (9, 3%). The youngest registered nurses in both hospitals were within the age range of 21-25 years (21, 7%). This finding is in agreement with Azodo et al. (2013) in their research on oral assessment and nursing interventions among Nigerian nurses' knowledge, practices, and educational needs which reported that most of the nurses were in the age range of 21-50 years. Similarly, Aliyu et al. (2017) submitted the age range as 18-50 years with a male-to-female ratio of 0.3:1. This falls within the active age range in the Nigerian public sector.

The result of the finding on the highest qualification of the respondents (subsection 5.3.1.3) in both teaching hospitals shows that majority of the nurses hold basic registered nurses (RN) certificate (145, 48.6%), closely followed by holders of bachelors of nursing sciences (BNSc) degree (127, 42.6%). Very few respondents had a bachelor of technology (B.Tech) degree (8,

2.7%), while some (16, 5.4%) had a Masters degree; the least respondents (2, 0.6%) had a doctoral degree (PhD). This result is in agreement with Okwaraji and Aguwa (2014) who submitted that more nurses (181, 86.2%) had the RN certificate compared to those with a nursing degree (29, 13.8%). The indications that there were more clinical nurses with RN certificates in the two teaching hospitals may be due to one of the distinctive objectives of a teaching hospital which is to provide medical education, training, and innovation in medical care, and simultaneously engage in the treatment of needy healthcare users. In Nigeria, nursing education is carried out in hospital-based schools of nursing for three years (leading to the award of registered nurse certificate) and in the universities for five years, leading to a Bachelor of Nursing Science degree. Both teaching hospitals have established a school of Nursing to train nurses on how to deliver efficient and effective quality care and conduct research. Upon completion of a first degree, individual nurses may proceed for a Masters programme to obtain M.Sc. (Nursing) and a Ph.D. (Nursing).

An examination of the years of experience of the respondents (subsection 5.3.1.4) revealed that the majority of the registered nurses (81, 27.2%) in the two teaching hospitals had spent between 1-5 years in the profession. On the other hand, the older nurses were found to have more years of work experience. Lee, Kim and Kim (2014) submitted in the study, regarding the respondents' years of work experience, 40.1% of the nurses had between 1-4 years of experience and 36.5% had between 5–10 years of experience. Bae's (2007) study on "the levels of nursing performance outcomes in the United States" showed significant differences between ages and between total years of work experience of nurses. The similarity of the findings of this study and Bae (2007) can be explicated by improvements in nursing knowledge and skills related to increased work experience over time. Based on these findings, nursing performance can be improved in the hospitals by the management and provision of adequate manpower.

The findings on the clinical unit of the respondents (subsection 5.3.1.5), reveal that the clinical unit that had the highest number of respondents in the two teaching hospitals were from the operating theatre (23, 7.7%) closely followed by the accident and emergency unit (21,7%). The high number of registered nurses in these clinical units may be due to referral from other hospitals in the environs. UCH and OAUTHC hospitals are among the first generation of hospitals established by the federal government and provide health services to the surrounding regions.

The results of the study revealed that, most of the job designation of the respondents (subsection 5.3.1.6) in the two teaching hospitals were nursing officers (76, 25.5%), closely followed by senior nursing officers (SNO) (71, 23.8%), and a considerable number of nursing office 11 (58, 19.5%). The least of the respondents had the job designation of ACNO (23, 7.7%). The high number of nursing officer 1 in the profession can be attributed to the training of the nurses in the hospital and the need for more nurses due to the aging population. The presence of many clinical nurses in the cadre of nursing officer, confirm the teaching aspect of the hospitals. The nurses need to get adequate education and training for the effective treatment of patients, and to specialise in their various fields. McHugh and Lake (2010) highlight that clinical nursing expertise are fundamental to quality of care. An individual nurse's education and years of expertise influence his or her level of expertise in providing quality healthcare delivery.

6.4 What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?

The first research question of this study was aimed at investigating the factors of KM capability influencing nursing care performance outcomes in health institutions in South west Nigeria. To address the first research question, the review of literature on KM was examined and based on Gold, Malhotra and Segars (2001) organisational capability theory, the measurement models were developed and tested using structural equation modelling. The factors of KM capability considered in this study include information technology support, organisational culture, organisational structure, and knowledge process capability. First, the connection between IT support and nursing care performance was examined by Hypothesis 1.

H₀₁: IT support does not have a positive influence on nursing care performance.

The result of the structural model assessment rejected the null Hypothesis H_{01} ($\lambda=0.341$, $t=4.919$, $p=0.000$). In other words, IT was found to have significant influence on nursing care performance. The results of the current study provide the evidence that information technology plays a considerable role in knowledge management effectiveness in nursing care roles in the two teaching hospitals in Nigeria. However, related previous studies in KM purported that technology have no direct and significant effect on the performance of an organisation (Powell

and Dent-Micallef, 1997; Anderson, 2009; Matin and Sabagh, 2015; Nguyet, 2010). Nevertheless, organisations leverage KM processes by applying technologies to improve their performance (Khalifa and Liu, 2003; Tanriverdi, 2005).

The result of this study is contrary to the findings of Anderson (2009) who sought to identify and access the relationship between organisational effectiveness, knowledge infrastructure capability, and knowledge process capability in a PhD study titled “Organisational capabilities as predictors of effective knowledge management”. The study sought to provide the validity of the organisational capability theory by Gold et al. (2001), that organisational effectiveness is the combined measure of knowledge infrastructure capability and knowledge process capability, which helps to fill the void of standards for assessing effectiveness. Anderson (2009) and Nguyet (2010) reported that technology did not directly influence organisational effectiveness. In agreement, Mils and Smith (2010) concluded that technology influences performance indirectly through knowledge infrastructure capabilities along with organisational culture and structure.

The findings of the present study are consistent with international literature that reported the benefits of IT use by nurses and the contribution to clinical care (Parish, 2000; Webster et al., 2003; Elfrink and Martin, 1996; Elfrink, Davis, Fitzwater, Castleman, Burley, Hughes, 2003; Lee, 2005; Mills and Stagers, 1994; Nahm and Posaton, 2000). Ghosh and Scott (2006) conducted a study on effective knowledge management systems for a clinical nursing setting and operationalised technological capability around information storage, knowledge mapping retrieval, and collaboration capabilities, and reported that technology plays an important role in supporting the nursing process. Similarly, Lee and Choi (2003) operationalised technological capability around information storage, retrieval, and collaboration capabilities, and reported that technology is significantly related with knowledge combination which has an impact on organisational performance.

Hsia et al. (2006) highlighted the interaction between nursing work and KM technical functions in developing a framework of nursing KM system and concluded that IT applications is required to analyse hospital-wide nursing care information and knowledge in the nursing process. They concluded that an efficient IT-based KM system has become a central force in improving quality of care. Technology enables nurses to find, interpret, organise and evaluate

information from a variety of sources to inform decision-making and problem-solving within patient care.

In a study by Mutula (2015) on the “factors influencing perceptions and attitudes of nurses towards the use of ICT in patient care in KwaZulu-Natal Province in South Africa”, results revealed a positive attitude of nurses towards the use of ICTs and concluded that ICTs, if well integrated into healthcare services, would substantially enhance the services provided by nurses. A similar study by Onu and Agbo (2013) in Nigeria affirms that the use of ICT has become a major tool in the delivery of health services and nurses need to engage fully in ICT for safe and better healthcare delivery.

Secondly, to address the first research question, the connection between organisational structure and organisational culture and nursing care performance, was examined by Hypothesis 2 and 3 respectively.

H₀₂: Organisational culture does not have a positive influence on nursing care performance.

H₀₃: Organisational structure does not have a positive influence on nursing care performance.

The result of the structural model assessment supported the null Hypothesis H₀₂ ($\lambda=0.059$, standard error=0.085, $t=1.038$, $p=0.299>0.05$). However, in H₁₀, it was found to have an indirect effect through knowledge process with path coefficient=0.464. In addition, the result of the structural model assessment supported the null Hypothesis H₀₃ (standardised value=0.062, standard error=0.090, $t=0.960$, $p=0.337>0.05$). This result indicates that organisational culture and organisational structure does not significantly influence significant nursing care performance.

The findings of this study are similar with extant literature that reported that organisational structure and organisational culture as elements of knowledge infrastructure that have no significant direct contribution to organisational performance. Nguyet (2010) utilised the resource-based view and knowledge-based view of the firm and the dynamic capability approach to investigate the main KM capabilities which are important for organisational competitive advantage. The findings revealed that organisational culture and organisational structure did not directly and significantly contribute to the competitive advantage of firms. However, the indirect positive effects were reported in the study. Similarly, Waluyo and

Wibowo (2011) in their study found culture and structure to be insignificantly related to corporate performance but was a significant predictor of KM process.

The finding of the current study is not in agreement with the results of prior studies such as (Nguyen, Neck and Nguyen, 2008; Anderson, 2009; Lee and Choi, 2003; Chuang, 2004; Matin and Sabagh, 2015). More specifically, Anderson (2009) used organisational capability theory in a PhD study at Nova South-eastern University entitled “Organisational Capabilities as Predictors of Effective Knowledge Management: An Empirical Examination”. The findings revealed that organisational structure had a direct influence on organisational effectiveness; however, organisational culture had no direct influence on organisational effectiveness. Their findings suggest that when culture and structure in KM infrastructure are investigated in isolation in the absence of KM processes, they may not positively impact organisational performance. However, in the presence of KM processes, the effects become significant. This is because KM infrastructure substantially has an impact on KM processes. Koushazade, Omidianpoor and Zohurian (2015) examined the “impact of organisational factors on the effectiveness of KM among nurses of Golestan hospital of Ahvaz, Iran”. The findings revealed that the largest impact of organisational factors on KM effectiveness was identified for infrastructural elements including structure and culture followed by social interactions.

In a similar study, Chuang (2004) employed the resource-based view of the firm to investigate the relationship between KM capability and competitive advantage. Chuang (2004) operationalised structural and cultural KM resource based on Gold et al. (2001). Multiple regression analysis was used to analyse the data, and revealed that structural and cultural KM resource was found to be essential for competitive advantage. This corroborates the findings of Nguyen, Neck and Nguyen (2009) that cultural KM capability makes a unique and significant contribution to a firm’s competitive advantage.

Additionally, the findings of Lee, Kim and Kim (2014) on the relationships between core factors of knowledge management in hospital nursing organisations and outcomes of nursing performance revealed that knowledge sharing culture had a strong impact on outcomes of nursing performance. Shih-Hsiung and Gwo-Guang (2013) who investigated organisational structures and cultures on KM highlighted the crucial importance of a knowledge-sharing culture and concluded that shared knowledge, experience and values are critical enablers and success factors for KM implementation. Carney (2011) reported several cultural influences

such as excellence in care delivery, ethical values, involvement, professionalism, value-for-money, cost of care, commitment to quality and strategic thinking that were found to be key cultural determinants in quality care delivery.

Watkins and Marsick (1996) suggest that to improve performance, organisations need to focus on cultural factors such as continuous learning and use of knowledge which can serve as critical factors in facilitating organisational learning for improvement in the operations of the organisation. Brown and Woodland (1999) similarly argued that it is impossible for an organisation to sustain improved performance without constantly learning and developing new knowledge. Moreover, managing culture, and changing culture are important functions that will enable the hospital to succeed (Sovie, 1993).

Finally, the connection between knowledge process and nursing care, was examined by Hypothesis 4.

H₀₄: Knowledge Process capability does not have a positive influence on nursing care performance.

The output of SEM revealed that the standardised regression weight of the structural path between knowledge process capability and nursing care performance was significant and positive. The estimate standardised value was 0.0652, standard error was 0.170, t-value was 3.330 and p-value was $0.000 < 0.01$. The results indicated that knowledge process capability positively and significantly influenced nursing care performance in Nigerian health institutions. Hence, the null hypothesis was rejected.

The result of the current study confirmed earlier research findings including USA (Gold et al., 2001), Vietnam (Nguyet, 2010), Jamaica (Mills and Smith, 2011), Korea (Lee and Choi, 2003; Lee and Lee, 2007), Australia (Migdadi, 2005), Hong Kong (Khalifa, Lam and Lee, 2001) and Taiwan (Chuang, 2004) that reported the existence of direct and significant relationship between knowledge management processes and organisational performance. A study was conducted by Reisi et al. (2013) to investigate the relationship between individual dimensions of KM process capability (knowledge acquisition, knowledge conversion, knowledge application and knowledge protection) and organisational effectiveness among selected sport

organisations in Iran. The results indicated that all dimensions of knowledge management process have direct and a significant relationship with organisational effectiveness.

The result of this study also validates the study of Ha, Lo and Wang (2016) on “the relationship between knowledge management process capabilities and organisational performance in the context of Malaysian SMEs”. The results indicated the existence of significant and direct relationship between dimensions of KM process capability and organisational performance. However, the result of this study is contrary to findings by Mills and Smith (2011), who conducted a study in Jamaica to examine the relationship between knowledge management process capability and organisational performance. They reported that knowledge acquisition, knowledge application and knowledge protection are positively related to organisational performance but not knowledge conversion.

Moreover, the present study did not examine the dimensions of KM processes in isolation. This is because such an approach is contrary to the interwoven nature of knowledge process. This study emphasises the importance of KM processes as integrated and linked activities in association with nursing care performance, a viewpoint which was ignored or only discussed in abstract terms in previous studies (Nielsen, 2006). Furthermore, Lee and Choi (2003) citing Beckman (1999) argued that KM processes are often simultaneous and not always in a linear sequence.

The results of the current study revealed that information technology had the strongest influence on nursing care performance. However, organisational culture and organisational structure had no significant direct influence on nursing care performance. Thus, the researcher concludes that although organisational culture and organisational structure does not influence nursing care performance directly, it indirectly has an influence through knowledge process.

6.5 What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?

The second research question of this study was aimed at investigating the relationship between knowledge infrastructure and knowledge process in KM capability and the impact of the relationship on nursing care performance in health institutions in South-west Nigeria. Based on the second research question, the relationship between the dimensions of knowledge

infrastructure (information technology, organisational structure, organisational culture) and knowledge process was investigated.

Although little research has investigated the significance of the relationship of KM infrastructure capabilities and KM process capabilities in nursing care delivery, extant literature had emphasised the role of knowledge management infrastructure as organisational mechanisms for fostering knowledge consistently and stimulating knowledge processes (Lee and Choi, 2003; Stonehouse and Pemberton, 1999; Smith, 2006; Anderson, 2009). Knowledge process can be thought of structured coordination for managing knowledge efficiently (Gold et al., 2001), while knowledge management infrastructure is necessary to increase the efficiency of knowledge process (Sarvary, 1999).

To address the second research question, the literature on organisational capability theory and KM capabilities was examined and structural models were developed and tested using SEM. The relationship was examined by the following hypotheses:

H₀₅: IT is not positively related to knowledge process in KM capability.

H₀₆: Organisational structure is not positively related to knowledge process in KM capability.

H₀₇: Organisational culture is not positively related to knowledge process in KM capability.

The results of the structural model assessment and an examination of the standardised regression weights rejected the Hypothesis H₀₅ ($\lambda=0.203$, $t=3.467$, $p=0.000$); H₀₆ ($\lambda=0.648$, $t=5.693$, $p=0.000$); and H₀₇ ($\lambda=0.187$, $t=3.093$, $p=0.002$). In other words, the result indicates that information technology, organisational structure and organisational culture in KM infrastructure are found to be positively and significantly related to in KM process in the teaching hospitals. This implies that improvement in technical, cultural and structural capabilities of the hospitals will lead to substantial improvements in KM process capability of the registered nurses. Furthermore, the results suggest that most of the differences in KM process capability can be explained by the inputs of technology, culture and structure with structure having the most influence. The result further implies that most of the differences in nursing care performance in the teaching hospitals can be explained by KM process capabilities while technological, structural and cultural infrastructure capabilities enable them to enhance nursing care outcomes. This result provides the evidence that information technology,

organisational structure and organisational culture play a considerable role in knowledge management process in nursing care roles in the two teaching hospitals.

The findings of this study agree with Bharadwaj, Chavhan and Raman (2015) on the impact of KM capabilities on KM effectiveness. KM infrastructure capabilities were explored with respect to information technology, structure, and culture; while KM processes comprised of creation/acquisition, storage, dissemination, and application. The study established both infrastructure capabilities and process capabilities play an important role in improving KM effectiveness mainly resulting in improved communication, enhanced collaboration, improved employee skills, better decision-making, and improved productivity. However, in conclusion, the researchers recommended the need to carry out further research in investigating the relationship between KM infrastructure and processes in the firm's performance. It will, thus, guide the managers to implement such activities in their organisations.

The result of the current study is further corroborated by Ghosh and Scott (2005) in their study on the major factors impacting knowledge management and processes in the clinical nursing function. The results indicated that organisational structure, information technology, and culture play a considerable role in nursing processes. Zaied (2012) investigated the correlation between knowledge management capabilities (infrastructure, processes and knowledge management functions) and organisational performance. The analysis results show that there is a positive and strong correlation between knowledge management dimensions of infrastructure and process in knowledge management functions.

Also, supporting the research finding of the present study, Lee (2017) in their investigation of the effects of knowledge management enablers on the knowledge management process of four Korean Tertiary hospitals, found that knowledge management enablers affect the knowledge management process in the hospitals. This is in line with the findings of the study of Paisittanand, Digman, and Lee (2009) on the effect of knowledge process capabilities and knowledge infrastructure capabilities on strategy implementation effectiveness, which provides strong support that knowledge infrastructure capability influences knowledge process capability. Smith, Mills and Dion (2010) suggested that the efficient management of knowledge is substantially associated with how well infrastructure factors are translated into the knowledge process of the organisation.

Furthermore, the result of this study is consistent with the suggestions of Dyer and Nobeka (2000), who asserted that knowledge infrastructure capability support and drive organisational members to transfer and create knowledge within and across organisations. In agreement with this explanation, Worren et al. (2002), and King and Zeithaml (2001) suggested that organisational infrastructures should be improved and reformed by the managers in order to facilitate knowledge processes and support organisational activities. In short it may be concluded that the hospitals' technological infrastructure, structural and cultural capability has a well-established role to play in leveraging the knowledge processes of the registered nurses in the improvement of patient care and in reducing medical errors to the barest minimum.

6.6 How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?

The third research question of this study was aimed at investigating the relationship between knowledge infrastructure and knowledge process in KM capability and the impact of the relationship on nursing care performance in health institutions in South-west Nigeria. After examining the relationship between the dimensions of knowledge management infrastructure and knowledge process, the impact of the relationship between these capabilities on nursing care performance was examined. To answer this question, organisational capability theory was utilised to assess the impact of the interrelationship of KM capabilities on nursing care performance.

Therefore, the study hypothesised that:

H₀₈: The relationship between IT support and knowledge process in KM capability positively influence nursing care performance.

H₀₉: The relationship between culture and knowledge process in KM capability positively influence nursing care performance.

H₀₁₀: The relationship between structure and knowledge process in KM capability positively influence nursing care performance.

The results of the structural model assessment and an examination of the standardised regression weights rejected the Hypothesis H₀₈ ($\lambda=0.132$, $t=3.312$, $p=0.000$); H₀₉ ($\lambda=0.576$,

$t=5.484$, $p=0.000$); and H_{010} ($\lambda=0.464$, $t=6.271$, $p=0.000$). This implies that the combined relationship between the dimensions of knowledge infrastructure and knowledge process strongly and significantly influence nursing care performance in the teaching hospitals. The result further implies that improvement in the combined relationship of technological, cultural, and structural capabilities of the teaching hospitals with knowledge process capabilities of the nurses will lead to strong and positive improvements in performance of the registered nurses.

The result of this study is consistent with other results that indicated that KM capability is positively associated with organisational performance as reported in KM literature (Massey et al., 2002; Lee and Choi, 2003; Tanriverdi, 2005; Schulz and Jobe, 2001). A related study of Lee, Kim and Kim (2012) on the integrated view of KM for performance in hospitals analysed the relationships between KM infrastructure which includes cultural, structural, and technology related factors and the knowledge process capabilities by expounding on the contribution of knowledge infrastructure and process capabilities as determinants of organisational performance. The result of their study indicates that KM infrastructure drives knowledge process capabilities. Bagheri, Hamidizadeh and Sabbagh, (2015:439) indicated that, “knowledge process capabilities in turn mediate the relationship between KM infrastructure and organisational performance which demonstrate the relevance of KM infrastructure and KM process for organisational performance”.

Also supporting the current research finding, Zaied (2012) in Egypt reported a strong positive correlation between the relationship of KM (infrastructure and process) and knowledge management functions. The results revealed that the strong positive correlation between KM capabilities and KM process strongly influenced organisational performance. Ghosh and Scott (2007) also argued that knowledge infrastructural capabilities such as technology, organisational culture and organisational structure, need to correspond with knowledge process capabilities (e.g. actual flow and use of knowledge) in order to achieve considerable improvements in effectiveness.

Findings of the current study reveal that a strong and positive relationship exists between information technology, organisational culture, and organisational structure in knowledge management infrastructure and knowledge management process, which plays a considerable role in improving nursing care roles in the two teaching hospitals.

6.7 How can KM capabilities be leveraged to increase nursing care performance?

As stated in section 4.3.4 of the methodology chapter, the mixed methods approach which combines the quantitative and qualitative approach was used in the study. The qualitative method was used as a complementary tool for the aspects not covered by the quantitative method. The quantitative method underpinned research question one to three, while qualitative method was used to answer research question four. The qualitative data collected through semi-structured interviews with the deputy directors of nursing services was used to answer research question 4 (how can KM capabilities be leveraged to increase nursing care performance?). However, to answer the research question interview questions were weaved around variables of study: information technology, organisational culture, organisational structure, and knowledge process capabilities to support nursing care. This is in line with organisational capability theory by Gold et al. (2001:196) which posits that, “organisational effectiveness is the outcome of the combined effectiveness of knowledge infrastructure capability and knowledge process capability”. Developing both infrastructure and process capability enables a firm to integrate and use new knowledge, therefore, creating ‘new knowledge for effective performance’ (Ajanaku, 2018).

6.7.1 Leveraging information technology to support nursing care

The assessment of the available technological infrastructure in form of IT support for the registered nurses in the two hospitals revealed that they had no form of IT support and availability of technological infrastructure was very low. The interview with the DDNS in the two hospitals revealed that mainly paper documentation is still being used for capturing data. Moreover, filing patients’ information was through a card system. The hospital information system available can only be assessed by the heads of department of nursing services.

Findings from the interview revealed that the teaching hospitals do not have enough capability to adopt new technologies due to inadequate IT infrastructure and inadequate funding. Most equipment in the two healthcare facilities is based on traditional technologies. Results further showed that lack of IT policy, high work demand, unavailability of computers, lack of access to computers, erratic power supply, and lack of support from the Federal Government were the major barriers to the use of information technology by the nurses in the health institutions. There is no integrated databases for administration, communication and knowledge sharing

among the registered nurses and other health care professionals in the teaching hospitals. These factors therefore need to be taken into consideration in any intervention that seeks to improve the nurses use of information technology in leveraging KM capabilities.

Access to IT resources by registered nurses enhances optimal nursing process and promotes good health intervention outcome. Effective nursing care delivery therefore requires access to information technology resources that can enhance patient care. Information technology use by nurses reduces medical errors and promotes evidence-based practice. Mutula (2015) noted that ICT tools have an important function in improving nursing care. Similarly, Rouleau, Gagnon and Côté (2015) pointed out that the use of ICTs by nurses can impact their practice by promoting patient-centred healthcare and improving quality of care.

The findings of the current study are consistent with available evidence in international literature (Madhavan et al., 2011; Barnard, Nash, and O'Brien, 2005;; Courtney, Demiris, and Alexander, 2005; Simpson, 2005) that the successful implementation of information technologies in nursing care for effective KM practice can only be achieved by the full integration of information technology into professional practice.

The findings of this study corroborate the submission of Irinoye et al., (2013) in their study entitled “Nurses’ perception and barriers to use of information communication technology in a teaching hospital in Nigeria”. They indicated that availability of ICT in the Nigerian healthcare facilities was low, and majority of the nurses reported they had never had formal training in information technology. Majority indicated that they had little or no skill in the use of spread sheets and databases. The nurses further highlighted that they do not have access to information technology.

Lupiáñez et al. (2011) pointed out that due to information explosion, information technologies are critical for quality healthcare delivery by nurses. The poor state of healthcare delivery in the African continent can be attributed to poor technological infrastructure (Akinsola, Herselman and Jacobs, 2005). The organisation and evaluation of information for informed decision-making and problem-solving is enhanced by the application of technology in nursing care delivery (Lee, 2005).

6.7.2 Leveraging organisational culture to support nursing care

The interview with the DDNS in the two teaching hospitals revealed that the organisational culture of both teaching hospitals is very supportive in terms of professional retraining and organisational learning of the registered nurses. Mandatory professional symposium and seminars are held across all the units and yearly continuing education programmes, workshops and conferences are done to promote productivity of the registered nurses. The DDNS further submitted that specialised training is organised for specialist nurses and they are deployed according to their area of specialisation to enhance effectiveness and efficiency. Moreover, periodic lectures that cut across all professions are organised. Nurses are rotated to promote productivity and yearly orientation is done in order to remove fatigue and boredom. It is apparent from the interviews that workshops, seminars, symposium and training was provided to bridge the gap between theory and practice, for the nurses to keep up with current trends and practices in the field. These knowledge activities were conducted on a regular basis to keep staff up-to-date, transfer information and experiences and refocus efforts to support medical doctors and professional nurses in their everyday tasks. In addition, orientation was also one of the mediums through which nurses' responsibilities were made clear to them.

The study revealed that the senior management support the promotion of the registered nurses, incentives and sponsorship to workshops and seminars for effective and efficient nursing care delivery; and innovations in healthcare were in line with the vision of the hospitals. This is in line with extant literature that reveal that a KM-supporting organisational culture which values knowledge highly and encourages its creation, sharing and application through the empowerment of individuals help to build organisational knowledge (Mårtensson, 2000; Chong and Choi, 2005; Jennex, Smolnik and Croasdell, 2009; Wong, 2005; Downes, 2014).

The finding of the current study is also consistent with the investigation by Hinno (2012) into "leadership support and registered nurses practice environment in hospital settings in Estonia, Finland and the Netherlands". The study revealed that the presence of supportive management was frequently identified as an important characteristic in registered nurses' practice environment. Laschinger et al. (2008) highlighted that nursing leadership team plays a crucial role in the provision of infrastructure and policy-direction in ensuring nurses are empowered to practice professionally and thus deliver high-quality care.

The current study revealed the important role of leadership in the provision of knowledge vision, development of an empowered workforce, a dynamic learning environment, transparent and extensive communication, and interaction across and within groups who make up the nursing workforce. This is essential considering the fact that organisational culture embedding leadership support is very important in leveraging KM capabilities to support nursing care in the provision of effective and efficient patient care.

6.7.3 Leveraging organisational structure to support nursing care

Organisational structure reflects the way in which responsibility and tasks are allocated among organisational members and the coordination of their different work procedures. For organisation to achieve its goals and objectives, the work of such organisation has to be divided among its members (Nahm, Vonderembse and Koufteros, 2003; Vera and Crossan, 2004). Effective nursing care delivery therefore, requires an organisational structure that makes possible the effective performance of the registered nurses and support effective knowledge flow and transfer.

Organisational structure has been identified as a major KM enabler by many researchers in literature (Bose, 2003; Chourides, Longbottom and Murphy, 2003; Holsapple and Joshi, 2000; Liebowitz, 1999; Wong, 2005; Suresh, 2002). The present study found that the predominant structure in clinical nursing in terms of the hierarchy of reporting relationships was operational/line authority in which the registered nurses hand over to each other and there is a clockwise coordination. The senior ward leader reports directly to the DDNS. The DDNS reports the history of patients and nurses under their leadership to the central management. The nurse leaders within the departmental structures were empowered with some influence in policy decisions, and confidence in the patient's ability to manage care after discharge.

Furthermore, results revealed that the nursing care team are structured with clear lines of communication reporting to an identified nurse in charge of the care of each clinical ward. This network of team members guides the seeking of information, guidance, as well as consultation within and beyond the care team. The coordination among units and departments is handled through mutual adjustment and mostly informal communications. Ghosh and Scott (2005) highlighted that the integration of the coordination among units and departments in hospitals

is highly important as it enhances collaboration among groups of healthcare providers and improvement in healthcare outcomes.

Results from the interview with the DDNS also illustrated that the two teaching hospitals were highly centralised and formalised. The teaching hospitals subscribed to formalised rules and formal procedure to ensure the management and governance of registered nurses and all health professionals act in accordance with espoused values. Annual performance evaluation is also used by the hospital management to evaluate the performance of the registered nurses which includes monthly metric rating of turnover of patients admitted, relation with patients and co-workers, and ability to discharge duties effectively. The result is also corroborated by Shukri and Ramli (2015) who investigated “the organisational structure and performance of Malaysian private hospitals”, focusing on top management structure. Their study similarly found that the private hospitals utilise formalised rules and written formal procedure. Organisational structure was also found to contribute to improved performances on the key areas of internal business processes, patient quality services, safety and satisfaction, organisational learning and growth, and financial returns. Koushazade et al. (2015) highlighted that the organisational factors for KM effectiveness among nurses at both individual and team levels include structure, social interaction such as trust, communication and coordination.

The result of the current study revealed the organisational structure support the effective collaboration, and knowledge sharing in terms of constructive criticisms and cross fertilisation of ideas among the registered nurses across the units in providing quality care. Kim and Lee (2006) highlighted that flexible organisational structures encourage knowledge sharing within the organisation and allows the creation of ad hoc cross-functional teams in which experts from different departments can collaborate to facilitate the flow of ideas across departments, whilst formalised and centralised structures (rigid structures) are major stumbling blocks to knowledge sharing. Gold et al. (2001) highlighted that there is need for flexibility of organisation structure in order to encourage sharing and collaboration across and within the organisation.

6.7.4 Leveraging knowledge processes to support nursing care

According to organisational capability theory knowledge process capabilities represent the basic operations for the input of knowledge assets. Ghosh and Scott (2005) and Gold et al.

(2001) identified the integrated processes for the management of knowledge assets as: acquisition or accumulation of knowledge; conversion or combination of knowledge; application or use of knowledge; and the protection of knowledge from inappropriate use.

The DDNS of the two teaching hospitals were asked during the interviews about the processes involved in acquiring, converting, applying and protecting knowledge by the registered nurses during patient care. They admitted that the KM processes involved is the use of the nursing process. The nursing process is the scientific method used by the registered nurses to ensure the quality of patient care and involves the assessing, diagnosing, planning, implementing and evaluating phases. In the assessment phase, the nurse gathers information about the patient's health and medical history. Physical examination such as taking vital signs and observable patient behaviours is used to gather assessment information. The diagnosing phase involves the nurse taking the information from the assessment phase, analyses the information and identifies problems where patient outcomes can be improved through the use of nursing interventions. The planning involves the nursing care plan in which a plan of action is developed, things needed for care, the other health practitioners involved and equipment to be used; after which the nursing care plan is implemented. The evaluation phase involves the nurse checking if the goals for patient wellness have been achieved; if the approach is not effective, reassessment is done.

A study by Ghosh and Scott (2007) entitled "Effective knowledge management systems for clinical nursing" supports the findings of this study. Ghosh and Scott (2007:76) indicated that in healthcare organisations, "the key KM transaction occurs between the nurse and the patient. Knowledge is created during the interaction between the patient and the nurse which is stored in the KM system by the nurse, the knowledge is then available to other nurses in future patient interaction scenarios". Furthermore, the creation of knowledge occurs through dedicated activities such as training, through collaboration with other healthcare professionals or interaction with patients and their family members/care givers. The organisation restructures the acquired knowledge by converting it into the form that makes it suitable for access and use. The structured knowledge is then applied to other relevant scenarios. The knowledge processes involved is usually a standard set of clinical activities such as the application of nursing processes. In agreement, Lampel and Mintzberg (1996) submitted that clinical nursing activity

involves a very high degree of knowledge acquisition and creation in the assessing and planning stage.

The study also revealed that ward rounds are also part of KM processes involved in nursing care. The DDNS of the two teaching hospitals indicated that a ward round is done for the patients on admission at all clinical wards where the nurse ward leaders and medical doctors assess the patients. Ward rounds provided also an opportunity for knowledge acquisition, conversion, and application for the health professionals as they shared experiences regarding the condition of patients. According to the Royal College of Physicians and Nursing (2012), ward rounds were a critical activity that brought together a multidisciplinary team of medical professionals to review and plan patient care. Chitha (2017) revealed that ward rounds were an important source of information. Ward rounds took place every morning, when medical doctors assessed and planned for each patient in consultation with senior professional nurses.

The findings of the current study also identified the problems associated with knowledge process activities in patient care. The DDNS of the two teaching hospitals highlighted the problems as shortage of skills, lack of manpower, resource scarcity, lack of electronic documentation and inadequate time to care properly for the patients. They also stated that there is lack of motivation in applying the nursing process and lack of organisational support in having the authority make decisions. Moreover, the registered nurses work in a stressful environment with dilapidated infrastructure which also makes it difficult at times to use the nursing process.

The findings further revealed the main challenges experienced by the nurses in caring for the patients. The DDNS of the two teaching hospitals highlighted the challenges as: power failure, inadequate water supply, exposure of nurses to diseases, bad structure, shortage of staff, obsolete equipment, inadequate resource and consumables to work with, corruption, lack of finances and budget for healthcare, inability of the patients to foot the expenses incurred for their healthcare. In some cases, the patients abscond; nurses face harassment by the relatives, there is shortage of manpower, an unsupportive government, and massive brain drain.

One of the DDNS interviewed stated that, “in 2014, 50% out of the nurses employed in the hospital have resigned and travelled out of the country due to the state of healthcare and marginalisation of nurses”. The solutions proffered to the problems associated with the use of

the nursing process and main challenges faced in nursing care include: ensuring the care plan and resources needed by the nurses are regularly provided by the management; employment of more nurses and equipping them with the needed skills and confidence to value the nursing process; provision of funds into the healthcare sector by the federal government as there is a high level of poverty among the people; and provision of modern equipment and nursing documentation needs to be computerised as manual procedures are still being used. The results of this study is consistent with previous studies which reported that the professional nurses in Nigeria do not have adequate infrastructure, capacity and resources for the provision of optimal patient outcomes (Olade, 2004; Okafor, 2005; Ezeugwu, 2007; Okaro, Ohagwu and Njoku, 2010).

Furthermore, in order to verify how KM capabilities can be leveraged to support nursing care in the two teaching hospitals, the study sought to identify the institutional KM policies that are in place to promote KM practices. The formulation and implementation of KM policies and other KM strategies are very necessary to leverage the effectiveness of KM capabilities in nursing care in the teaching hospitals. The DDNS admitted that their respective teaching hospitals did not have any KM policy. Moreover, the concept of KM is relatively new to them. Several studies have identified the implementation of KM policy as one of the critical success factors pertinent to leverage knowledge resources for the success of knowledge management in organisations. In agreement, Dewah and Mutula (2016) affirmed that the formulation of knowledge management policies to enhance efficiency and service delivery in public agencies is critical. Adopting the right strategy of KM for informed clinical decision making is important for delivery of high-quality healthcare (Shahmoradi, Safadari and Jimma, 2017).

6.8 Summary

This chapter discussed the findings using extant empirical literature and the organisational capability theory of knowledge management that underpinned the study. This study has found that KM capabilities influenced nursing care performance outcomes in the two selected teaching hospitals in South-west, Nigeria.

The demographic characteristics of the respondents reveal that, there were more female nurses than male nurses. Most of the respondents were within the age range of 31-35 years and hold basic registered nurses (RN) certificate. Furthermore, most of the job designations of the

respondents in the two teaching hospitals were nursing officers. This may be due to one of the distinctive objectives of a teaching hospital which is to provide medical education and training. In Nigeria, nursing education is carried out in hospital-based schools of nursing for three years (leading to the award of registered nurse certificate). The majority of the registered nurses in the two teaching hospitals, had spent between 1-5 years in the profession and also the clinical unit that had the highest number of respondents in the two teaching hospitals were from the operating theatre closely followed by the accident and emergency unit.

The findings revealed that the factors of KM capability influencing nursing care performance outcomes in the two teaching hospitals are information technology and knowledge process capabilities. Organisational structure and organisational culture capabilities have no direct and significant contribution to nursing care performance. The results provide the evidence that information technology and knowledge process play a considerable role in knowledge management effectiveness in nursing care roles in the two teaching hospitals in Nigeria. Information technology was found to have the strongest influence on nursing care performance. However, through knowledge process capability, structural and cultural capabilities were found to contribute significantly and indirectly to nursing care performance.

The findings further revealed that information technology, organisational structure and organisational culture in KM infrastructure are found to be positively and significantly related to KM process in the teaching hospitals. The result suggested that most of the differences in KM process capability can be explained by the contribution of information technology support, organisational structure and organisational culture with organisational structure having the most influence. This result provides the evidence that information technology, organisational structure and organisational culture plays a considerable role in knowledge management process with organisational structure having the strongest influence on knowledge management processes in nursing care roles in the two teaching hospitals.

Based on paucity of research, the study investigated how the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance. The findings revealed that the combined relationship between knowledge infrastructure and knowledge process strongly and significantly influence nursing care performance in the teaching hospitals. The result further implied that improvement in combined relationship of technological, cultural and structural capabilities of the teaching hospitals with

knowledge process capabilities of the registered nurses will lead to substantially positive improvements in their nursing care performance.

These results provided the evidence that strong and positive relationship between information technology, organisational culture and organisational structure in knowledge management infrastructure and knowledge management process plays an important role in improving nursing care performance in the two teaching hospitals.

The study revealed that there are no functional IT policies in the two teaching hospitals and the registered nurses had no form of IT support and availability of IT infrastructure was inadequate. Moreover, the teaching hospitals do not have enough capability to adopt new technologies due to inadequate IT infrastructure and inadequate funding. Results showed that high work demand, unavailability of computers, lack of access to computers, erratic power supply, and lack of support from the Federal Government were the major barriers to the use of information technology by the nurses in the health institutions.

The study further revealed that elements of organisational culture such as trust mechanisms, professional retraining, organisational learning, collaboration among the nurses, rotation of nurses and incentives and leadership support are critical success factors in leveraging KM capabilities to support nursing care. The study found that the organisational structure of the two teaching hospitals was highly centralised and formalised and consists of formalised rules and formal procedure to ensure the management and governance of registered nurses. The study revealed that organisational structure in terms of the hierarchy of reporting relationships and the coordination among units and departments for effective collaboration and knowledge sharing is also an important factor for efficient knowledge management.

The findings showed that knowledge processes in nursing care involved the use of the nursing process in which the identified four interrelated processes of acquisition, conversion, application and protection of knowledge assets are intertwined. The nursing process is a scientific method used by nurses to ensure the quality of patient care and involves the assessing, diagnosing, planning, implementing and evaluating phases. The identified problems associated with knowledge process activities in patient care included: shortage of skills, lack of manpower, resource scarcity, lack of electronic documentation, inadequate time to care properly for the patients, lack of motivation in applying the nursing process, lack of

organisational support in having the authority to make decisions and working in a stressful environment with dilapidated infrastructure.

The findings further revealed the main challenges experienced by the nurses in caring for the patients included power failure, inadequate water supply, exposure of nurses to diseases, bad structure, shortage of staff, obsolete equipment, inadequate resources and consumables to work with, corruption, lack of finances, inability of the patients to foot the expenses incurred for their healthcare, harassment of nurses by the relatives, shortage of manpower, unsupportive government and massive brain drain. The barriers identified have serious implications for the quality of patient care provided.

The study results also showed that the two teaching hospitals did not have any KM policy. Moreover, the concept of KM is relatively new to them. Overall KM capabilities have a significant role to play in promoting effective and efficient healthcare by supporting registered nurses with KM practices and promoting evidence-based practice. The benefits of KM are especially important in Africa, which suffers from a lot of barriers to quality care. Critical success factors must be taken into consideration in order to leverage nursing care performance (see chapter 3, section 3.11). The next chapter presents the summary, conclusion and recommendations of the study.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This chapter presents the summary of the findings, conclusion, and recommendations of the study. This study sought to investigate knowledge management capabilities in nursing care performance in two selected teaching hospitals in the South-west region of Nigeria. The study addressed the following research objectives:

1. To investigate the factors of KM capability affecting nursing care performance outcomes in health institutions in South-west Nigeria.
2. To investigate the relationship between knowledge infrastructure and knowledge process in KM capability on nursing care performance.
3. To examine how KM capability can be leveraged to support nursing care performance outcomes.

Based on the above research objectives, four corresponding research questions were investigated as follows:

1. What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?
2. What relationship exists between knowledge infrastructure and knowledge process in KM capability on nursing care performance?
3. How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability affect nursing care performance?
4. How can KM capability be leveraged to support nursing care performance?

The study was underpinned by the pragmatic paradigm and guided by organisational capability theory. A mixed methods approach incorporating both qualitative and quantitative research approaches was applied in the study with survey design. The population of study consisted of registered nurses in two purposively selected teaching hospitals in South-west region. A survey questionnaire was used to collect quantitative data from the registered nurses, while semi-structured interviews were used to collect qualitative data from the deputy directors of nursing

services. Three sampling methods were used to recruit respondents namely stratified sampling, purposive sampling, and the census method.

Purposive sampling was used to select two teaching hospitals in the South-west region of Nigeria, stratified sampling was used to select the registered nurses, and the deputy director of nursing services was purposively selected for semi-structured interviews. Quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) version 22 to generate descriptive statistics that were used to present data in the form of tables, percentages, allow for the identification of general trends and patterns; and AMOS version 22 for structural equation modelling. Quantitative data was analysed using content analysis. To ensure adequate reliability of the questionnaire Cronbach's coefficient alpha was used to measure the internal consistency of the questionnaire items. Item-total correlations and principal component analysis (PCA) were applied to check the construct validity, followed by a varimax rotation. Validity and reliability of the instruments were achieved through a pilot study and modification of the contents. Research ethics were complied based on University of KwaZulu-Natal research ethics policy and protocol. In addition, permission was obtained from the individual hospitals that were surveyed.

This chapter also provides the originality of the study, contribution to the study and suggestions for further research due to some limitations in the study.

7.2 Summary of research findings

This section presents the summary of the findings under each of the research questions. The summary is subsequently used to draw conclusions and propose recommendations. The study targeted 320 respondents from which 298 completed and returned the survey questionnaires giving a response rate of 93%. In addition, out of the 14 deputy directors of nursing services (DDNS), 9 directors were interviewed, giving a response rate of 64%. The findings of this study are summarised below under the relevant research questions:

7.2.1 What are the factors of KM capability influencing nursing care performance outcomes in health institutions in South-west Nigeria?

The identified factors of KM capability in the study are knowledge infrastructure and knowledge process capabilities. Knowledge infrastructure capability is identified by

information technology, organisational structure, and organisational culture. Knowledge process capabilities is identified by acquisition, conversion, application and protection processes. The findings generally revealed that information technology and knowledge process capability influence nursing care. Nevertheless, organisational structure and organisational culture on the other hand do not have a direct significant influence on nursing care performance.

7.2.2 What relationship exists between knowledge infrastructure and knowledge process in KM capability?

The findings generally reveal that the dimensions of knowledge infrastructure-organisational culture, organisational structure, and information technology are found to be positively and significantly related to KM process in the teaching hospitals. The findings revealed that most of the differences in KM process capability can be explained by the various contributions of information technology support, organisational structure, and organisational culture with organisational structure having the most significant relationship with KM process.

7.2.3 How does the relationship that exists between knowledge infrastructure and knowledge process in KM capability influence nursing care performance?

The findings revealed that the positive and significant relationship that exists between the three dimensions of knowledge infrastructure and knowledge process positively and significantly influence nursing care performance. The results revealed that the strong positive association between KM infrastructure and KM process strongly influenced nursing care performance.

7.2.4 How can KM capability be leveraged to support nursing care performance?

Key findings from semi-structured interviews revealed that there is no functional IT support policy regarding nursing care in the two teaching hospitals. Although computer training is provided for the registered nurses, it is only used for the purpose of promotion. There is also paucity of IT infrastructure in the two hospitals. The lack of IT support for nurses may be a hindrance to efficient and effective patient care.

The two teaching hospitals have a supportive culture in terms of the nurses' recognition of the importance of the hospitals vision and values towards providing optimal healthcare to

individuals, families, and communities. Furthermore, the culture supports KM in terms of professional training, organisational learning, and collaboration for exchange of information and sharing of knowledge. In addition, the senior management supports promotion, provides incentives and sponsorship to workshops and seminars. The organisational structure of both hospitals in terms of hierarchy of reporting relationships and departmental boundaries supports effective collaboration, cross-fertilization of ideas, knowledge creation and coordination and control among the clinical units.

The knowledge process involved in nursing care involves the use of the nursing process in delivery of care. The nursing process is a series of steps that assist the nurse in using her knowledge to diagnose the ailment of the patient and implement therapeutic actions for providing optimal care. The nursing process comprises of five sequential and interrelated phases of assessment, diagnosis, planning, implementation, and evaluation; these phases are in sequence, but become a continuous cycle after the process has begun. During assessment and diagnosis, knowledge about the patient ailment is acquired or created. Nurses store the created knowledge in their KM system. In future this becomes available for other nurses and doctors to give better service to the patient. Nurses share this knowledge in different ways with other nurses and doctors. This knowledge transfer could be in the form of shift meetings, during the rounds of patient ward and through charts. The knowledge is documented and protected from inappropriate or unauthorised use.

The organisation coordinate the efforts of different units for improved performance through use of clinical nursing report where reports of care are given by all ward leaders to the DDNS and DDMS reports to the central management. The use of annual performance evaluation report is utilised for the nurses' performance.

Overall, the challenges affecting KM in nursing care in the two teaching hospitals include lack of KM policy, shortage of nurses, out-dated and obsolete equipment, decapitated infrastructure, inconsistent supply of consumables, materials, power failure, insufficient budget, and lack of motivational incentives, poor working conditions, and poor salary. Some of the solutions proffered were the need for provision of adequate financial resources and replacement of out-dated equipment by the government; implementation of IT facilities; provision of consistent power supply and employment of more skilled nurses while ensuring continuous re-training. The findings showed that the two hospitals had no policy guiding KM practices. Furthermore,

policies guiding information technology support had not been implemented. In addition, results revealed that there is inadequate support from the Federal government in the selected hospitals.

7.3 Conclusion

This research has shown that knowledge management capabilities are a contributing factor to nursing care performance. The findings conform to organisational capability theory by Gold et al. (2001) that effective knowledge management as measured by its impact on organisational performance is dependent on the firm's knowledge infrastructure capability and knowledge process capability.

The three dimensions of knowledge infrastructure- culture, structure, and technology were found to be significant components of infrastructure capability. They were also found to influence knowledge process capability. Research has suggested that an organisation's culture is one of the most significant components of effective knowledge management. Gold et al. (2001) found that knowledge infrastructure capability significantly influences the performance of an organisation. In this study, although structure and culture were not directly linked to nursing care performance, it was found to have a significant relationship with knowledge process, with technology having the most significant influence on knowledge process. Culture and structure is found to have an indirect influential effect on nursing care performance through knowledge process capability. A knowledge friendly structure as noted in literature will influence organisational effectiveness.

Technology was found to be a crucial component of knowledge infrastructure. This is consistent with the research of Gold et al. (2001). Technology was found to have a direct and significant influence on nursing care performance. The results also suggest that technology plays a considerable role in nursing care performance due to its positive direct relationship with knowledge management processes. These findings are consistent with the literature. For example, Ghosh and Scott (2005) operationalised technological capability around information storage, retrieval, and collaboration capabilities, similar to this study.

With regard to knowledge process capability, it was found to influence nursing care performance positively and significantly. Knowledge processes were found to be positively and significantly related to knowledge infrastructure. The present study considers KM process as interrelated and integrated. The relationship between infrastructure and process capability

was not explored by Gold et al. (2001) and no known research exists that examines the intersection of these themes. However, because of the practical implications in healthcare it was important to explore it in this study. Of the three knowledge infrastructure capability components, organisational structure has the strongest influence on the knowledge processes. This can be explained by the importance of structure as an enabler of effective knowledge management, particularly as a facilitator for managing knowledge processes. As noted in the literature, network of relationships enables the processes of acquiring, converting, and applying knowledge and information, (e.g., Alavi and Leidner, 2001; Davenport and Prusak, 1998; Leonard, 1995; Teece, 1998; Anderson, 2009). The knowledge process involved in the nursing care delivery is the use of the nursing process in which the processes of acquiring, converting, applying, and protecting knowledge and information are embedded.

It is also concluded that leadership support, flexible organisational structure, knowledge friendly culture, implementation of functional technical infrastructure, the formulation, and implementation of KM policies and other KM strategies are critical success factors to leverage knowledge management capabilities in nursing care in the teaching hospitals. Because of the challenges experienced by the nurses in caring for the patients, this affected the quality of patient care. The quality of healthcare delivery is highly determined by the adoption of precise strategy of KM for informed decision making in clinical services.

Fundamentally, this study has established the dimensions of KM capability that contribute to nursing care performance. It is concluded that the performance of the registered nurses is primarily informed by the influence of IT support and type of organisational culture and structure of the teaching hospitals. From a practical point of view, the relationship among variables of information technology, structure and culture may provide a clue of how health institutions can adjust KM infrastructure for improvement in KM process in order to sustain nursing care delivery in providing quality care.

7.4 Recommendations

Based on the findings of this study, the literature reviewed the following recommendations as proposed. The recommendations are made in the following areas: KM policy, investment in information technologies (IT), KM infrastructure, KM strategies, change management, top management support, KM measurement, training, and barriers to KM in nursing care.

7.4.1 KM policy

Policies allow informed decisions to be made about situations and actions to be taken. It is recommended that the teaching hospitals formulate and implement KM policy. Formulation and implementation of KM policy may help the teaching hospitals to support healthcare professionals to determine the type of knowledge required and assist in seamless acquisition, application, dissemination, and protection of health-related knowledge. KM policy will provide directions, procedures, and standards in terms of skills, manpower, equipment, and infrastructure for efficient KM in the teaching hospitals.

7.4.2 Investment in Information Technologies

Information technology is an important component of knowledge management infrastructure. KM programmes require the use of information technologies to capture, organise, codify, disseminate, and store knowledge. It is recommended that in this era of knowledge explosion and due to the high rate of knowledge generated by the teaching hospitals, the teaching hospitals should invest in modern IT. These technologies would assist the organisations to enhance knowledge processes such as knowledge creation, sharing and transferring knowledge more rapidly among the registered nurses and other healthcare professionals. Modern IT improves the efficiency of healthcare professionals by reducing waiting times; minimises paperwork and makes information readily accessible for use by the hospital personnel. These technologies should include electronic documentation and integrated electronic health record system to ensure the capture of real-time information and knowledge on patients. The use of IT by the registered nurses offers opportunities to provide effective and efficient quality care to patients.

7.4.3 KM infrastructure

The findings of this study established that organisational culture and organisational structure are significant components of KM infrastructure which in conjunction with KM processes has a significant influence on nursing care performance. Therefore, it is recommended that the organisational structure be made flexible for KM as organisational structure influences KM process through shaping patterns of communication among organisational members, and influences decision making and effectiveness in implementing new ideas. Previous researchers

had emphasised that flexible organisational structures are suited for KM practices with ease of communication and the ability to respond quickly to change (Mahmoudsalehi et al., 2012).

Furthermore, it is imperative to pay attention to the organisational culture in order to leverage KM to improve nursing care performance. There is a consensus among researchers that organisational culture plays an important role in quality of care (Khan, Usoro, and Majewski, 2010; Al-Adaileh and Al-Atawi, 2011; Sikorska-Simmons, 2008; Scott et al., 2003; Aarons and Sawitzky, 2006). A knowledge-friendly culture incorporates sets of beliefs and values around how the organisation views and facilitates learning and innovation and how it encourages employees to build and manage organisational knowledge.

7.4.4 Formulation of knowledge management strategy

The findings of the current study supported with the literature review, demonstrates an urgent need for top management support in healthcare institutions to consider formulating a knowledge management strategy. It is therefore recommended that the health institutions should firstly revise their organisational strategies and designs to include KM in their vision and mission statement. The KM strategy needs to ensure the contents are aligned with corporate values, technologies, resources, available skills, organisational culture, organisational structure, and organisational objectives.

7.4.5 Change Management

With the introduction of KM in the teaching hospitals, many changes are bound to take place. It is recommended that the health institutions be prepared to manage change when KM programmes are introduced. In order to minimize the resistance of some organisational members, the organisation should involve the employees and give them ample opportunity to learn and what needs to be known about the benefits of KM.

7.4.6 Top Management Support

Previous studies highlighted the importance of top management support in the creation and dissemination of knowledge. Leadership provides the knowledge vision, develop, and promote sharing of knowledge assets for improved performance of the organisation. It is recommended that the senior nurse leaders such as the assistant deputy directors and deputy directors of nursing services exhibit the willingness to promote cross boundary learning and sharing, and

helping to set up knowledge networks across the clinical units. The nurse leaders should also ensure the registered nurses are empowered by assisting to develop the skills of the nurses in their professional practice and thus deliver high quality care. In addition, top management has a role in shaping the culture of the health institutions and removing organisational constraints for effective knowledge management.

7.4.7 KM Measurement

KM measurement ensures that KM objectives are being achieved and effective. It is recommended that the health institutions should put in place indicators and metrics for measuring KM. This will assist in improving efficiency and enhancing effectiveness of KM. Wong (2005) asserted that KM measurement demonstrates the effectiveness, value, and worthiness of KM to top management and other stakeholders, substantiating the continued support and confidence of top management.

7.4.8 Capacity building

Training equips managers and employees to fulfil their responsibilities and creates effective work behaviour that supports KM (Jennex et al., 2009). It is recommended that the health institutions invest more in educational and training programmes for the registered nurses. The educational and training programmes should incorporate elements of KM practice such as the importance of sharing knowledge and in using KM system and other technological tools for patient care. The health institutions should be able to make available what has been learned and provide motivational incentives on knowledge sharing and innovation.

7.5 Contribution of the Study

The contribution of this study can be considered from the point of view of literature, theory practice, policy, and society. A major contribution of this study lies in the fact that, it is the first of its kind to examine KM capabilities in the selected teaching hospitals in South-west Nigeria, particularly at University College Hospital, Ibadan, Nigeria, and Obafemi Awolowo University teaching hospitals complex, Ile-Ife, Nigeria.

This study adds to literature by contributing to the body of research in knowledge management, as an aspect of health informatics particularly with the paucity of literature in the field of knowledge management in the healthcare sector in African countries, especially in the Nigerian

context. The study has also provided an insight into the influence and importance of KM capabilities to nursing care delivery. In addition, the study contributes to the current debate and discussions on knowledge management in healthcare.

Theoretically, the study contributes to the body of literature on organisational capability theory by Gold et al. (2001). The study was also the first of its kind to use organisational capability theory to examine the KM capabilities that influence nursing care performance from the perspective of Nigeria and Africa. The study joins in the debate and discussion about organisational capability theory. The evidence from the study provide a strong opportunity for better understanding of KM capabilities that can be leveraged to improve nursing care delivery in Nigeria and Africa respectively. The study thus extends the application of organisational capability theory in health institutions in the developing country context.

The study contributes to practice by creating the awareness of the capabilities of KM in teaching hospitals for increased productivity, improved performance, and efficient service delivery. The study brings to the fore the need to utilise knowledge resources to support registered nurses in teaching hospitals and therefore contributes to practice by providing strategies of improving nursing care delivery.

From a policy perspective, the findings of this study have the potential to influence the formulation of KM policy in the Nigerian health institutions. The study revealed the need for the teaching hospitals to implement policies that will promote and enhance knowledge management. The findings provide policy direction to the policy makers, nursing leaders and stakeholders in the health institutions on KM development and implementation. KM policy is critical to address KM procedures, strategies, and practices to be adopted and should ensure that information systems policies are designed to enable KM, which supports healthcare professionals.

In terms of contribution to the society, the factors of KM such as information technology, organisational culture, organisational structure, leadership support, collaboration, training, and capacity building were identified as having significant influence on nursing care delivery. Therefore, this study contributes to the understanding of these highlighted factors, harnessing them for improved nursing care delivery.

7.6 Originality of the study

Originality involves the exploration of the unexplored and the unanticipated. Originality is the making of a new discovery that adds to scientific knowledge (Guetzkow, Lamont and Mallard, 2004:3). Furthermore, Guetzkow et al. (2004) highlight the importance of originality to its presumed role in knowledge building; it is through originality, in greater or smaller increments that knowledge advances. Chigada (2014) argues that one can be original in many ways such as: setting down a major piece of new information in writing for the first time; continuing a previously original piece of work; carrying out original work designed by the supervisor; providing a single original technique, observation or result in an otherwise unoriginal but competent piece of research; and Showing originality in testing somebody's idea.

The originality of the present study lies in the fact that there is a paucity of empirical studies on KM capabilities in nursing care performance in Nigerian teaching hospitals. There is no empirical research to date that has investigated into any aspect of KM and its influence on nursing care performance in selected teaching hospitals that is underpinned by Organisational Capability theory in South-west Nigeria. This study as proposed, intended to fill this gap and that makes this study original. This is the first study conducted in the South-west region of Nigeria investigating the role played by KM in enhancing nursing care performance. Given the scope and the collected data, the study findings would contribute significantly to the body of the literature available on the subject in the context of Nigeria.

Several studies on KM in healthcare have been undertaken and majority of these studies are more focused on developed countries. Not much is known regarding KM in developing countries (Sanghani, 2008). Extant literature reviewed revealed that KM research in Nigeria is very low (Ajiferuke, 2003; Olasina, 2012; Nwafor and Salau, 2009; Ajakaiye and Olusola, 2003; Suraj and Ajiferuke 2013). Furthermore, despite the empirical research in KM in healthcare, research to support conceptual clarity for KM in nursing care delivery is low.

Previous studies of KM in nursing care have been fragmented in that they have explained some aspects of the influence of KM but have not provided a holistic view of KM framework. Using a holistic view of organisational capability theory, this study has provided insights to KM for researchers because it explains the integrated aspects of KM capabilities by examining the relationships between knowledge infrastructure and knowledge process capability and nursing

care outcomes. The current study is therefore significant in contributing to the scholarly research and literature on the KM and nursing care performance in health institutions in the context of developing countries.

7.7 Suggestions for further Study

The present study investigated the KM capabilities influencing nursing care performance in selected teaching hospitals in Nigeria using organisational capability theory. The findings of the study provide a foundation for future research seeking to examine other KM factors that impact nursing care delivery in Nigeria. The study contains some limitations and therefore provides a baseline and insight into future research of KM capabilities for enabling improved nursing care performance in developing countries.

The study was limited to two teaching hospitals in Nigeria and focused on South-west geopolitical zone only. Further research should be conducted in other geopolitical zones to generalise the impact of the factors of KM in these health institutions. The present study was only conducted in federal teaching hospitals in Nigeria; future research could be carried out in the state government and private hospitals to compare their findings. Furthermore, the study excluded other healthcare professionals. This presents an opportunity for expanded research and design to address this limitation and better examine the sequential relationships between KM capabilities and patient outcomes. Future research could obtain data from other healthcare professionals not considered in the study.

The final sample size (n=298) for this study also presents limitations for generalising results to the wider nursing population. More sample size is needed to generalise findings. An inherent limitation of the study was the focus on a single developing country- Nigeria. The findings presented can be used as a baseline to inform other empirical studies that investigate KM in nursing care in developing countries. Replicating this study in other developing countries especially in Africa would be most informative.

This study employed a mixed methods approach with the dominance of the quantitative approach over qualitative approach. A purely qualitative study may be conducted to gain deeper understanding of the phenomenon being studied. In addition, other nurse leaders such as the assistant deputy director of nursing services could be sampled.

It is suggested that the theoretical model should be further explored. The results of the study indicated that two research hypotheses were supported. Therefore, more similar research is required in the context of a developing country context to reassess the empirical result.

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APPENDICES

APPENDIX 1- QUESTIONNAIRE SURVEY QUESTIONNAIRE FOR REGISTERED NURSES

Dear Respondent,

This study is entitled “**Knowledge management capability in nursing care performance in selected teaching hospitals in South-west Nigeria**” The findings may assist teaching hospitals to improve nursing care by utilising knowledge-based resources and at the same time contribute toward understanding better knowledge management strategies in nursing care services. I will be extremely grateful if you could assist me in this endeavor by answering the questions to best of your knowledge. Please note that your responses are anonymous and confidential and will be used by the researcher only for the purposes of research.

Definitions of Key Terms

Information Technology Support in this study refers to the technological tools to support nursing care-planning and record-keeping standardizing and structuring the activities surrounding it, and making it transferable between nurses on one unit, between units, and among health care settings

Knowledge in this study is defined as knowledge associated with nursing process in each stage of patient care such as nursing assessment, diagnosis, outcome identification, planning, implementation and evaluation of patient’s progress.

Knowledge Management in this study is defined as the systematic management of an organisation's knowledge assets for the purpose of creating value and meeting tactical and strategic requirements for quality patient care.

Knowledge Management Capability refers to the organisation's ability to assemble, integrate, and deploy valued resources which encompasses clinical processes and routines

Nursing Care Performance refers to the effectiveness and efficiency of knowledge management practices among nurses which is defined by the capacity demonstrated by the organisation to acquire nursing resources and use them in a sustainable manner.

Organisational Structure in this study is defined as how activities such as task allocation, coordination and supervision directed toward the achievement of organisational aims.

- 6.5 Pediatrics []
- 6.6 Critical/Intensive care []
- 6.7 Labour ward []
- 6.8 ENT []
- 6.9 Ophthalmology []
- 6.10 Orthopedic []
- 6.11 Virology []
- 6.12 Others (please specify) []

7. What is your job title/designation?

- 7.1 Assistant Director Nursing Services (ADNS) []
- 7.2 Chief Nursing Officer (CNO) []
- 7.3 Assistant Chief Nursing Officer (ACNO) []
- 7.4 Senior Nursing Officer (SNO) []
- 7.5 Nursing officer 11 []
- 7.6 Nursing Officer 1 []
- 7.7 Others (please specify) []

8. How many years of work experience do you have since you qualified?

- 8.1 1-5 []
- 8.2 6-10 []
- 8.3 11-15 []
- 8.4 16-20 []
- 8.5 21 years and above []

SECTION 2: Knowledge Management Capability

Please indicate (by circling the appropriate box) the extent to which you agree or disagree with each of the statements from captions 'Information Technology' through 'Nursing care Performance'. The following scale is applied for all statements:

1	2	3	4	5
Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)

1. Information Technology

	My organisation has IT that allows...	SD	D	N	A	SA
IT1	Collaboration with other clinical staff in the organisation	1	2	3	4	5
IT2	Mapping of the location of specific type of knowledge	1	2	3	4	5
IT3	Search for new clinical knowledge	1	2	3	4	5
IT4	Retrieve and use knowledge about clinical processes and services such as use of electronic medical records, personal digital assistants, computers and tablets	1	2	3	4	5
IT5	Generation of new clinical processes in conjunction with other health institutions	1	2	3	4	5
IT6	Clear rules for formulating or categorizing its clinical process knowledge	1	2	3	4	5
IT7	Monitoring of clinical processes	1	2	3	4	5
IT8	Support for communication among the nurses and other clinical staff	1	2	3	4	5

2. Organisational Structure

	My organisation...	SD	D	N	A	SA
OS1	Structure of departments and divisions inhibits interaction and sharing of knowledge	1	2	3	4	5
OS2	Structure promotes collective rather than individualistic behaviour	1	2	3	4	5
OS3	Encourages employees to go where they need for clinical knowledge	1	2	3	4	5
OS4	Manages frequently examine clinical knowledge for errors/mistakes	1	2	3	4	5
OS5	Structure facilitates the creation of new knowledge across structural boundaries	1	2	3	4	5
OS6	Structure facilitates the discovery of new clinical knowledge	1	2	3	4	5
OS7	Designs processes to facilitate knowledge exchange across functional boundaries	1	2	3	4	5

Organisational Culture

	In my organisation...	SD	D	N	A	SA
OC1	Nursing staff understand the importance of knowledge to clinical success	1	2	3	4	5
OC2	High levels of participation are expected in capturing and transferring knowledge	1	2	3	4	5
OC3	On the job training and learning are valued	1	2	3	4	5
OC4	Nursing staff are encouraged to discuss patient care problems with nurses in other departments	1	2	3	4	5
OC5	Senior management clearly support the role of knowledge management to nursing care success	1	2	3	4	5
OC6	Has adequate support services to allow me to spend time with my patients	1	2	3	4	5
OC7	Overall organisational objectives and vision is clearly stated	1	2	3	4	5

Knowledge Acquisition Process

	My organisation...	SD	D	N	A	SA
AP1	Has processes for acquiring knowledge about patients	1	2	3	4	5
AP2	Has processes for generating new knowledge from existing knowledge	1	2	3	4	5
AP3	Has processes for distributing knowledge throughout the organisation	1	2	3	4	5
AP4	Has processes for inter departmental collaboration	1	2	3	4	5
AP5	Has processes for acquiring knowledge about new clinical services	1	2	3	4	5
AP6	Has processes for benchmarking performance	1	2	3	4	5
AP7	Has teams devoted to identifying best practices	1	2	3	4	5
AP8	Has processes for exchanging knowledge between nurses and other clinical staff	1	2	3	4	5

Knowledge Conversion Process

	My organisation...	SD	D	N	A	SA
CP1	Has processes for converting knowledge into the design of new clinical services	1	2	3	4	5
CP2	Has processes for filtering knowledge	1	2	3	4	5

CP3	Has processes for transferring organisational knowledge to individuals	1	2	3	4	5
CP4	Has processes for distributing knowledge throughout the organisation	1	2	3	4	5
CP5	Has processes for integrating different sources and types of knowledge	1	2	3	4	5
CP6	Has processes for organizing knowledge	1	2	3	4	5
CP7	Has processes for replacing out-dated knowledge	1	2	3	4	5
CP8	Has processes for absorbing knowledge from individuals into the organisation	1	2	3	4	5

Knowledge Application Process

	My organisation...	SD	D	N	A	SA
APP1	Has processes for applying knowledge learned from experiences	1	2	3	4	5
APP2	Has processes for using knowledge in development of new clinical services	1	2	3	4	5
APP3	Has processes for using knowledge to solve new problems	1	2	3	4	5
APP4	Matches sources of knowledge to patient problems and challenges	1	2	3	4	5
APP5	Uses knowledge to improve efficiency	1	2	3	4	5
APP6	Is able to locate and apply knowledge to changing clinical conditions	1	2	3	4	5
APP7	Makes knowledge accessible to those who need it	1	2	3	4	5
APP8	Quickly applies knowledge to critical needs	1	2	3	4	5

Knowledge Protection Process

	My organisation...	SD	D	N	A	SA
PP1	Has processes to protect clinical knowledge from inappropriate use inside the organisation	1	2	3	4	5
PP2	Has processes to protect clinical knowledge from inappropriate use outside the organisation	1	2	3	4	5
PP3	Has technology that restricts access to some sources of knowledge	1	2	3	4	5

PP4	Values and protects knowledge embedded in individuals	1	2	3	4	5
PP5	Clearly communicate the importance of protecting knowledge	1	2	3	4	5
PP6	Has extensive policies and procedures for protecting patient secrets	1	2	3	4	5
PP7	Knowledge that is restricted is clearly identified	1	2	3	4	5
PP8	Has processes that encourage the protection of knowledge	1	2	3	4	5

Nursing care Performance

	My organisation...	SD	D	N	A	SA
NP1	Improves the timeliness of patient care	1	2	3	4	5
NP2	Improves the overall effectiveness of patient care in terms of my knowledge, skill, experience and attitude.	1	2	3	4	5
NP3	Reduces unnecessary patient transfer or returns	1	2	3	4	5
NP4	Responsive to complaints from patients and families	1	2	3	4	5
NP5	Improves the service productivity of nursing staff	1	2	3	4	5

Thank you.

Olateju Jumoke Ajanaku

APPENDIX 2- INTERVIEW GUIDE

INTERVIEW GUIDE FOR NURSING DIRECTORS

Dear Respondent,

This study is entitled “**Knowledge management capability in nursing care performance in selected teaching hospitals in South-west Nigeria**” and focuses on the influence of knowledge management infrastructure capabilities, knowledge management process capabilities on nursing care performance.

The findings may assist teaching hospitals to improve nursing care by utilising knowledge-based resources and at the same time contribute toward understanding better knowledge management strategies in nursing care delivery services. I will be extremely grateful if you could assist me in this endeavor by answering the questions to best of your knowledge. The interview will take approximately one hour. Please note that your responses are anonymous and confidential and will be used by the researcher only for the purposes of research.

Definitions of Key Terms

Information Technology Support in this study refers to the technological tools to support nursing care-planning and record-keeping standardizing and structuring the activities surrounding it, and making it transferable between nurses on one unit, between units, and among health care settings.

Knowledge in this study is defined as knowledge associated with nursing process in each stage of patient care such as nursing assessment, diagnosis, outcome identification, planning, implementation and evaluation of patient’s progress.

Knowledge Management in this study is defined as the systematic management of an organisation's knowledge assets for the purpose of creating value and meeting tactical and strategic requirements for quality patient care. It consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge.

Knowledge Management Capability refers to the organisation's ability to assemble, integrate, and deploy valued resources which encompasses clinical processes and routines

Organisational Structure in this study is defined as how activities such as task allocation, coordination and supervision directed toward nursing care in the achievement of organisational aims.

Organisational Culture represents the collective values, beliefs and principles including the organisation's vision, norms, systems, symbols, language, assumptions, beliefs, and habits.

Nursing Care Performance refers to the effectiveness of knowledge management practices among nurses which is defined by the capacity demonstrated by the organisation to acquire nursing resources and use them in a sustainable manner.

Section A: Profile and Clinical roles of Nurses

1. Please provide information relating to your qualification, name of teaching hospital where you are working and your designation?
2. Can you tell me how long you have been working in the hospital?
3. How would you describe your experience of looking after the patients?
4. What are the academic qualifications and experience required to be a registered nurse in your health institution?
5. What are the roles of nurses in providing efficient patient care?
6. Have you received any management training or training in specific aspects related to management?

Section B: Knowledge management capabilities in nursing care

Information Technology

7. Do you have policies guiding IT support in clinical processes by the nursing staff in your health institution?
8. What are the types of IT support available for nurses?
9. What are the IT tools provided for accessing knowledge in patient care?
10. To what extent has your health institution provided training for nurses in the use of IT tools?
11. What are the problems associated with the use of IT by the nurses?
12. How do you think such problems can be resolved?

Organisational Structure

13. Please provide information about your organisational structure in relation to creation of knowledge and application in patient care.
14. Does the existing structure support trust mechanisms in knowledge transfer among nurses across the units in the teaching hospital?
15. How does the organisational structure support collaboration and knowledge sharing among the nurses across the units in providing quality patient care?
16. How does the organisational structure affect nursing care performance in providing efficient health care delivery?
17. What constraints does the organisational structure have on effective knowledge management practices in nursing care?
18. How can such constraints be addressed?

Organisational culture

19. What are your organisation's objective and vision?
20. Please provide information about your organisational culture in relation to the system of corporate values?
21. How does the organisational culture support knowledge management in nursing care in terms of professional training and organisational learning?
22. What is your perception about senior management support of knowledge management practices in nursing care?
23. What are the barriers created by the organisational culture in providing efficient nursing care?
24. How can the barriers to effective knowledge management created by the organisational culture be surmounted?

Knowledge process

25. What policies are in place for knowledge management processes among the nursing staff?
26. What are the tools available for knowledge processes in nursing care?
27. Please describe the processes involved in acquiring and converting knowledge by the registered nurses in your health institution?

28. Please describe the processes involved applying and protecting knowledge by the registered nurses in patient care in your health institution?
29. What are the problems associated with knowledge process strategies in patient care among the nurses?
30. How do you think such problems can be resolved?

Nursing care Performance

31. In general how would you describe the quality of nursing care delivered to patients in your hospital in terms of care coordination, patient safety and organisational standards?
32. How does the organisation coordinate the efforts of different units in providing patient care?
33. What are the organisational constraints for nurses in providing patient care?
34. What are the main challenges experienced by the nurses in caring for patients?
35. What solutions do you proffer to the challenges experienced by the nurses in caring for patients?
36. What are the key resources that need to be provided for in caring for patients?

Any other relevant comments

.....
.....
.....

Thank you

Olateju Jumoke Ajanaku

APPENDIX 3 - OAU INFORMED CONSENT LETTER FOR QUESTIONNAIRE



Information Studies
School of Social Sciences
University of KwaZulu-Natal
Pietermaritzburg Campus
South Africa
Private Bag X01
Scottsville
Telephone: + 27(0)332605007
14th August 2017

Dear Respondent,

INFORMED CONSENT LETTER

OAUTHC/ERC protocol number: ERC/2016/11/05

OAUTHC/ERC duration of approval: 24/11/2016 – 30/11/2017

I, Ms Olateju Jumoke Ajanaku kindly invite you to participate in the research project entitled “Knowledge management capability on nursing care performance in selected teaching hospitals in South-west Nigeria”. This research project is undertaken as part of the requirements of the PhD, which is undertaken through the, Information Studies Department, University of KwaZulu-Natal, South Africa.

The study seeks to improve practice, inform practice and extend frontiers of knowledge by utilising posing on knowledge management in order to improve the performance of nursing care in teaching hospitals for quality healthcare delivery. Findings from this study can potentially improve the understanding of how knowledge management enablers and nursing knowledge processes relates with one another and can be strategically utilized to improve nursing care in health institutions.

Participation in this research project is voluntary. You may refuse to participate or withdraw from the research project at any stage and for any reason without any form of disadvantage. There will be no monetary gain from participating in this research project. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Department of Information Studies, at the University of KwaZulu-Natal. The questionnaire will take approximate 15 minutes to complete. If you have any questions or concerns about participating in this study, please feel free to contact myself or my supervisor at the numbers indicated below. Thank you for participating in this research project.

RESEARCHER

Ms Olateju Jumoke Ajanaku
University of KwaZulu-Natal
Telephone number: +2774720 6921/ +2348099441685
Email: 215082275@ukzn.ac.za/ tejlad@yahoo.com

SUPERVISOR

Prof Stephen Mutula
University of KwaZulu-Natal
Telephone number: +27 (0)33-260 5093
Email: mutulas@ukzn.ac.za

HSSREC RESEARCH OFFICE

Full Name: Prem Mohun
HSS Research Office
Govan Bheki Building
Westville Campus
Contact: +27(0)312604557
Email: mohunp@ukzn.ac.za

APPENDIX 4 - OAU INFORMED CONSENT LETTER FOR INTERVIEW



Information Studies
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University of KwaZulu-Natal
Pietermaritzburg Campus
South Africa
Private Bag X01
Scottsville
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14th August 2017

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APPENDIX 5 - UCH INFORMED CONSENT LETTER FOR QUESTIONNAIRE



Information Studies
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14th August 2017

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UI/UCH EC assigned number: UI/EC/16/0155:

UI/UCH EC duration of approval: 07/08/2017 – 06/08/2018

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APPENDIX 6 - UCH INFORMED CONSENT LETTER FOR INTERVIEW



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14th August 2017

Dear Respondent,

INFORMED CONSENT LETTER

UI/UCH EC assigned number: UI/EC/16/0155:

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of how knowledge management enablers and nursing knowledge processes relates with one another and can be strategically utilized to improve nursing care in health institutions.

Participation in this research project is voluntary. You may refuse to participate or withdraw from the research project at any stage and for any reason without any form of disadvantage. There will be no monetary gain from participating in this research project. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Department of Information Studies, at the University of KwaZulu-Natal. The interview will take approximate 35 minutes to complete. If you have any questions or concerns about participating in this study, please feel free to contact myself or my supervisor at the numbers indicated below.

Thank you for participating in this research project.

RESEARCHER

Ms Olateju Jumoke Ajanaku

University of KwaZulu-Natal

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APPENDIX 7 - DECLARATION OF CONSENT FORM

DECLARATION OF CONSENT

I.....(Full Name)
hereby confirm that I have read and understand the contents of this letter and the nature of the
research project has been clearly defined prior to participating in this research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Participants Signature.....

Date.....

APPENDIX 8 - LETTER OF INTRODUCTION TO OAUTHC CHIEF MEDICAL DIRECTOR



12/08/2016

The Chief Medical Director
Obafemi Awolowo University Teaching Hospitals Complex
Ile-Ife
Osun State
Nigeria

Dear Sir/Madam,

RE: Miss Olateju Jumoke Ajanaku – PhD Student at University of Kwa-Zulu Natal

This letter serves to introduce and confirm that Miss Olateju Jumoke Ajanaku is a duly registered PhD (Information Studies) candidate at University of Kwa-Zulu Natal. The title of her research is “Knowledge Management Capability on Nursing care Performance in Selected Teaching Hospitals in Southwest Nigeria”. Findings from this study can potentially improve the understanding of how components of knowledge infrastructure (Information Technology, organizational structure, organizational culture) and nursing knowledge process relates with one another and can be strategically utilized to improve nursing care in health institutions. The study seeks to improve practice, inform practice and extend frontiers of knowledge by utilizing positioning on knowledge management in order to improve the performance of nursing care in teaching hospitals for quality healthcare delivery.

As part of the requirements for the award of a PhD degree, she is expected to undertake original research in an environment and place of choice. The UKZN ethical compliance regulations require her to provide proof that the relevant authority where the research is to be undertaken has given approval.

We appreciate your support and understanding to grant Miss Olateju Jumoke Ajanaku permission to carry out research in your institution. Should you need any further clarification do not hesitate to contact me. Thank you in advance for your understanding.

Prof Stephen Mutula



Dean & Head of School of Social Sciences
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Email: mutulas@ukzn.ac.za

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

APPENDIX 9 - LETTER OF SELF -INTRODUCTION TO OAU HEAD OF DEPARTMENT. OF CLINICAL SERVICES



Department of Information Studies
School of Social Sciences
University of Kwa-Zulu Natal
Pietermaritzburg Campus
South Africa
11th August 2017

The Head of Department
Clinical Nursing Services
Obafemi Awolowo University Teaching Hospitals
Osun State
Nigeria

Dear Sir/Ma,

Request for Permission to Collect Data for PhD Research

I, Ms Olateju Jumoke Ajanaku, a doctoral student of Information Studies Department, University of Kwa-Zulu Natal, South Africa, write to solicit for your consent to access the clinical wards in Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) for the purpose of data collection. My study is entitled "Knowledge Management Capability on Nursing care Performance in Selected Teaching Hospitals in Southwest Nigeria". Questionnaires are to be administered to the registered nurses in the cadre of Assistant Director Nursing services (ADNS) to Nursing office 11. Semi-structured interview will be conducted with all the Deputy Director Nursing Services (DDNS).

The collected data will be used solely for research work. The findings may assist teaching hospitals to improve nursing care by utilizing knowledge-based recourses and the same time contribute toward understanding better knowledge management strategies in nursing care services.

Thank you for your anticipated cooperation.



Olateju Jumoke Ajanaku

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa

Telephone: +27 (0) 33 260 5571

Facsimile: +27 (0) 33 260 5092

Email: mutulas@ukzn.ac.za

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

APPENDIX 10 - LETTER OF INTRODUCTION TO UCH CHIEF MEDICAL DIRECTOR



07/06/2016

The Chief Medical Director
University College Hospital,
Ibadan.
Nigeria.

Dear Sir/Madam,

RE: Miss Olateju Jumoke Ajanaku – PhD Student at University of Kwa-Zulu Natal

This letter serves to introduce and confirm that Miss Olateju Jumoke Ajanaku is a duly registered PhD (Information Studies) candidate at University of Kwa-Zulu Natal. The title of her research is “Knowledge Management Capability on Nursing care Performance in Selected Teaching Hospitals in Southwest Nigeria”. Findings from this study can potentially improve the understanding of how components of knowledge infrastructure (Information Technology, organizational structure, organizational culture) and nursing knowledge process relates with one another and can be strategically utilized to improve nursing care in health institutions. The study seek to improve practice, inform practice and extend frontiers of knowledge by utilizing posing on knowledge management in order to improve the performance of nursing care in teaching hospitals for quality healthcare delivery.

As part of the requirements for the award of a PhD degree, she is expected to undertake original research in an environment and place of choice. The UKZN ethical compliance regulations require her to provide proof that the relevant authority where the research is to be undertaken has given approval.

We appreciate your support and understanding to grant Miss Olateju Jumoke Ajanaku permission to carry out research in your institution. Should you need any further clarification do not hesitate to contact me.
Thank you in advance for your understanding.

Prof Stephen Mutula

Dean & Head of School of Social Sciences
University of KwaZulu Natal
Private Bag X01 Scottsville, 3209
Pietermaritzburg Campus
Tel: +27 (033) 260 5571; Cell: +27 712 750 109
Email: mutulas@ukzn.ac.za

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa

Telephone: +27 (0) 33 260 5571

Facsimile: +27 (0) 33 260 5092

Email: mutulas@ukzn.ac.za

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

APPENDIX 11 - LETTER OF SELF INTRODUCTION TO UCH CHIEF MEDICAL DIRECTOR



Department of Information Studies
School of Social Sciences
University of Kwa-Zulu Natal
Pietermaritzburg Campus
South Africa
27th September 2016

To:
The Chief Medical Director,

Through:
The Chairman, Medical Advisory Committee,

Through:
The Deputy Director of Nursing (WARDS) and Head of Department
University College Hospital,
Ibadan.
Nigeria.

Dear Sir,

Request for Permission to Collect Data for PhD Research

I, Ms Olateju Jumoke Ajanaku, a doctoral student of Information Studies Department, University of Kwa-Zulu Natal, South Africa, write to solicit for your consent to access the clinical wards in Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) for the purpose of data collection. My study is entitled "Knowledge Management Capability on Nursing care Performance in Selected Teaching Hospitals in Southwest Nigeria". Questionnaires are to be administered to the registered nurses in the cadre of Assistant Director Nursing services (ADNS) to Nursing office 11. Semi-structured interview will be conducted with all the Deputy Director Nursing Services (DDNS). The collected data will be used solely for research work.

Thank you for your anticipated cooperation.

Yours faithfully,


Olateju Jumoke Ajanaku

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa

Telephone: +27 (0) 33 260 5571

Facsimile: +27 (0) 33 260 5092

Email: mutulas@ukzn.ac.za

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

APPENDIX 12 - UCH APPROVAL 1



INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT) College of Medicine, University of Ibadan, Ibadan, Nigeria.



Director: **Prof. Catherine O. Falade**, MBBS (Ib), M.Sc, FMCP FWACP
Tel: 0803 326 4593, 0802 360 9151
e-mail: cfalade@comui.edu.ng lillyfunke@yahoo.com

UI/UCH EC Registration Number: **NHREC/05/01/2008a**

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Knowledge Management Capability in Nursing Care Performance in Healthcare Delivery of Selected Teaching Hospitals in South-West, Nigeria

UI/UCH Ethics Committee assigned number: UI/EC/16/0155

Name of Principal Investigator: **Olateju J. Ajanaku**
Address of Principal Investigator: Department of Information Studies,
School of Social Sciences,
University of Kwa-Zulu Natal,
Pietermaritzburg, South Africa

Date of receipt of valid application: 08/06/2016

Date of meeting when final determination on ethical approval was made: **11/08/2016**

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and *given full approval by the UI/UCH Ethics Committee.*

This approval dates from **11/08/2016 to 10/08/2017**. If there is delay in starting the research, please inform the UI/UCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the UI/UCH EC assigned number and duration of UI/UCH EC approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC early in order to obtain renewal of your approval to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. No changes are permitted in the research without prior approval by the UI/UCH EC except in circumstances outlined in the Code. The UI/UCH EC reserves the right to conduct compliance visit to your research site without previous notification.



Professor Catherine O. Falade
Director, IAMRAT
Chairperson, UI/UCH Ethics Committee
E-mail: uiuchec@gmail.com

Research Units • Genetics & Bioethics • Malaria • Environmental Sciences • Epidemiology Research & Service
• Behavioural & Social Sciences • Pharmaceutical Sciences • Cancer Research & Services • HIV/AIDS

APPENDIX 13 - UCH APPROVAL 2



INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
College of Medicine, University of Ibadan, Ibadan, Nigeria.



Director: **Prof. Catherine O. Falade**, MBBS (Ib), M.Sc., FMCP, FWACP
Tel: 0803 326 4593, 0802 360 9151
e-mail: cfalade@comui.edu.ng lillyfunke@yahoo.com

UI/UCH EC Registration Number: **NHREC/05/01/2008a**

Notice of Renewal of Approval

Re: Knowledge Management Capability in Nursing Care Performance in Healthcare Delivery of Selected Teaching Hospitals in South-West, Nigeria

UI/UCH Ethics Committee assigned number: UI/EC/16/0155

Name of Principal Investigator: **Olateju J. Ajanaku**
Address of Principal Investigator: Department of Information Studies,
School of Social Sciences,
University of Kwa-Zulu Natal,
Pietermaritzburg, South Africa

Date of receipt of application: 07/08/2017

Status: 2nd Approval

This is to inform you that the UI/UCH Ethics Committee has received your application for renewal of approval on the above titled research. The report states that the study has not started due to delay in obtaining approval from the Higher Degree Committee of the University of Kwa-Zulu Natal and Social Science Research Ethics Committee of the University.

The Committee notes the contents of the report and having found it satisfactory, hereby approves your request for renewal of approval for **one year of study only**.

This renewed approval dates from **07/08/2017 to 06/08/2018**. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the UI/UCH EC assigned number and duration of UI/UCH EC approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC at least four weeks before the expiration of this approval in order to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. No changes are permitted in the research without prior approval by the UI/UCH EC except in circumstances outlined in the Code. The UI/UCH EC reserves the right to conduct compliance visit to your research site without previous notification.



Professor Catherine O. Falade
Director, IAMRAT
Chairperson, UI/UCH Ethics Committee
E-mail: uiuchec@gmail.com

Research Units • Genetics & Bioethics • Malaria • Environmental Sciences • Epidemiology Research & Service
• Behavioural & Social Sciences • Pharmaceutical Sciences • Cancer Research & Services • HIV/AIDS

APPENDIX 14 - UCH DIRECTOR OF CLINICAL SERVICE DIRECTOR APPROVAL



UNIVERSITY COLLEGE HOSPITAL, IBADAN

The pioneer Teaching Hospital in Nigeria.

PM.B. 5116, Ibadan Tel: 0700 824 4357, +234 02 903 1012, +234 02 903 1021 Email: cmd@uch-ibadan.org.ng Website: www.uch-ibadan.org.ng

September 30, 2016

Ms. Olateju Jumoke Ajanaku,
Department of Information Studies,
School of Social Sciences,
University of Kwazulu-Natal,
Inyuvesi Yakwazulu-Natali,
Pietermaritzburg,
South Africa.

Dear Ms. Ajanaku,

Re: Permission to Collect Data

Please refer to your letter dated September 27, 2016 on the above subject. I hereby inform you that approval has been given for you to collect data from nurses in the hospital for your study titled **"Knowledge Management Capability in Nursing Care Performance in Healthcare Delivery of Selected Teaching Hospitals in South-West, Nigeria."**

Please liaise with the Head of Clinical Nursing Department, who is by a copy of this letter being informed of the need to give you the necessary assistance in this regard. You must acknowledge the University College Hospital, Ibadan in the final report of your research. You will also submit a copy of the report to the office of the Chairman, Medical Advisory Committee of this Hospital.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'A. O. Afolabi', is written over a faint, illegible stamp.

Dr. A. O. Afolabi
Director of Clinical Services, Research & Training
Chairman, Medical Advisory Committee
For: Chief Medical Director

Prof. Temitope O. Alonge - MBBS (Ibadan), FRCS Edinburgh, FWACS, MD Leicester, FPA - *Chief Medical Director*
Dr. Adetemi O. Afolabi - MBBS (Ibadan), FWACS - *Chairman, Medical Advisory Committee; Director of Clinical Services, Research & Training*
Mr. P. O. Oloosun - Bsc (Hons) Pol. Sci, MBA, AHA, MNIM, ACIPM - *Director of Administration & Secretary to the Board*

APPENDIX 15 - UCH DEPUTY DIRECTOR OF NURSING SERVICE APPROVAL




UNIVERSITY COLLEGE HOSPITAL, IBADAN
The pioneer Teaching Hospital in Nigeria.

PM.B. 51116, Ibadan Tel: 0700 824 4357, +234 02 903 1012, +234 02 903 1021 Email: cmd@uch-ibadan.org.ng Website: www.uch-ibadan.org.ng

September 30, 2016

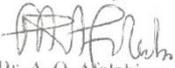
Ms. Olateju Jumoke Ajanaku,
Department of Information Studies,
School of Social Sciences,
University of Kwazulu-Natal,
Inyuvesi Yakwazulu-Natali,
Pietermaritzburg,
South Africa.

Dear Ms. Ajanaku,

Re: Permission to Collect Data

Please refer to your letter dated September 27, 2016 on the above subject. I hereby inform you that approval has been given for you to collect data from nurses in the hospital for your study titled "Knowledge Management Capability in Nursing Care Performance in Healthcare Delivery of Selected Teaching Hospitals in South-West, Nigeria."

Please liaise with the Head of Clinical Nursing Department, who is by a copy of this letter being informed of the need to give you the necessary assistance in this regard. You must acknowledge the University College Hospital, Ibadan in the final report of your research. You will also submit a copy of the report to the office of the Chairman, Medical Advisory Committee of this Hospital.

Yours sincerely,

 Dr. A. O. Afolabi
 Director of Clinical Services, Research & Training
 Chairman, Medical Advisory Committee
 For: Chief Medical Director

Noted & signed 28/08/17

*Attn: DDNS & Coordinating ADN
F71 & FNA
Signed 28/08/17*

Prof. Temitope O. Alonge - MBBS (Ibadan), FRCS Edinburgh, FWACS, MD Leicester, FPA - Chief Medical Director
 Dr. Adesimi O. Afolabi - MBBS (Ibadan), FWACS - Chairman, Medical Advisory Committee; Director of Clinical Services, Research & Training
 Mr. P. O. Oloosun - Bsc (Hons) Pol. Sci, MBA, AHA, MNIM, ACIPM - Director of Administration & Secretary to the Board

APPENDIX 16 - OAU APPROVAL

ETHICS AND RESEARCH COMMITTEE (ERC)

OBAFEMI AWOLowo UNIVERSITY TEACHING HOSPITALS COMPLEX

Tel: +2348152092751 +2348152092755 +2348152092999

E-mail: oauthc.ethicalcommittee@yahoo.com

CHAIRMAN: Prof. (Mrs.) E.A. Adejuyigbe MBChB(IFE)FMC Paed.
REGISTRATION NUMBERS:
INTERNATIONAL: IRB/IEC/0004553 NATIONAL: NHREC/27/02/2009a

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: ERC/2016/11/05

PROJECT TITLE: KNOWLEDGE CAPABILITY IN NURSING CARE PERFORMANCE IN SELECTED TEACHING HOSPITALS IN SOUTH WEST NIGERIA

INVESTIGATOR: MISS. OLATEJU JUMOKE AJANAKU

DEPARTMENT /INSTITUTION: DEPARTMENT OF INFORMATION STUDIES, SCHOOL OF SOCIAL SCIENCES, UNIVERSITY OF KWA-ZULU NATAL, PIETERMARITZBURG, SOUTH AFRICA

DATE OF RECEIPT OF VALID APPLICATION: 01/09/2016

DATE WHEN FINAL DETERMINATION ON ETHICAL APPROVAL WAS MADE: 23/11/2016

DURATION OF APPROVAL: Twelve (12) Months

This is to inform you that the research described in the submitted protocol, the informed consent forms and other participant information materials have been reviewed and given full approval by the OAUTHC Ethics and Research Committee.

The approval is from 24/11/2016 to 30/11/2017. You are to inform the Committee the commencement date of the research and if there is any delay in starting the research, please inform the Committee so that the date of approval can be adjusted accordingly. All informed consent forms used in the study must carry the OAUTHC/ERC protocol number and duration of approval of the study. In multi-year research you are to submit an annual report in order to obtain renewal of approval.

The National Code of Health Research Ethics required that you comply with all institutional guidelines, rules and regulations including ensuring that all adverse events are reported promptly to the OAUTHC/ERC. No changes are permitted in the research without prior approval by the OAUTHC/ERC. The OAUTHC/ERC reserves the right to conduct compliance visit to your research site without previous notification.


Prof. (Mrs.) E.A. Adejuyigbe,
Chairman, OAUTHC/ERC

APPENDIX 17 - OAU DEPUTY DIRECTOR OF NURSING SERVICE APPROVAL

RECEIVED
14 AUG 2017
DEPARTMENT OF INFORMATION STUDIES
UNIVERSITY OF KWAZULU-NATAL



UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

12/08/2016

Department of Information Studies
School of Social Sciences
University of Kwa-Zulu Natal
Pietermaritzburg Campus
South Africa
11th August 2017

The Head of Department
Clinical Nursing Services
Obafemi Awolowo University Teaching Hospitals
Osun State
Nigeria

Dear Sir/Ma,

Request for Permission to Collect Data for PhD Research

I, Ms Olateju Jumoke Ajanaku, a doctoral student of Information Studies Department, University of Kwa-Zulu Natal, South Africa, write to solicit for your consent to access the clinical wards in Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) for the purpose of data collection. My study is entitled "Knowledge Management Capability on Nursing care Performance in Selected Teaching Hospitals in Southwest Nigeria". Questionnaires are to be administered to the registered nurses in the cadre of Assistant Director Nursing services (ADNS) to Nursing office 11. Semi-structured interview will be conducted with all the Deputy Director Nursing Services (DDNS).

The collected data will be used solely for research work. The findings may assist teaching hospitals to improve nursing care by utilizing knowledge-based recourses and the same time contribute toward understanding better knowledge management strategies in nursing care services.

Thank you for your anticipated cooperation.

Olateju Jumoke Ajanaku

School of Social Sciences

Postal Address: Private Bag X01, Scottsville, 3209, South Africa
Telephone: +27 (0) 33 260 5571 Facsimile: +27 (0) 33 260 5092
Email: mutulas@ukzn.ac.za

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

14/08/17

All Units in WGH
Kmadly obliged her

Chimamaka P. 14/08/17

APPENDIX 18 - UKZN APPROVAL



2 August 2017

Ms Olateju Jumoke Ajanaku 215082275
School of Social Sciences
Pietermaritzburg Campus

Dear Ms Ajanaku

Protocol reference number: HSS/0512/017D

Project title: Knowledge Management Capability in Nursing Care Performance in selected Teaching Hospitals in Southwest Nigeria

Full Approval – Expedited Application

In response to your application received 9 May 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Professor SM Mutula
cc. Academic Leader Research: Professor Maheshvari Naidu
cc. School Administrator: Ms Nancy Mudau

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za

Website: www.ukzn.ac.za



100 YEARS OF ACADEMIC EXCELLENCE

Four (4) Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

APPENDIX 19 – EDITOR’S LETTER



Barbara Mutula
Associate member

Membership number: MUT001
Membership year: March 2018 to February 2019

0786439029
kabangebarbara@gmail.com

www.editors.org.za

13 October 2018

TO WHOM IT MAY CONCERN

This is to confirm that the dissertation written by Miss Ajanaku Olateju Jumoke, titled **‘Knowledge Management Capability in Nursing Care Performance in Selected Teaching Hospitals in South-West, Nigeria’** was copy edited for layout (including numbering, pagination, heading format, justification of figures and tables), grammar, spelling and punctuation by the undersigned. The document was subsequently proofread and a number of additional corrections were advised.

The undersigned takes no responsibility for corrections/amendments not carried out in the final copy submitted for examination purposes.

A handwritten signature in purple ink, appearing to read 'Barbara Mutula-Kabange', written over a horizontal line.

Mrs. Barbara L. Mutula-Kabange

Copy Editor, Proof reader
*BEd (UBotswana), BSSc Hons Psychology (UKZN),
MEd Educational Psychology (UKZN)*