



Knowledge management enablers affecting patient care: The perspective of registered nurses in South West Nigeria

**Authors:**

Olateju J. Ajanaku¹ 
Stephen Mutula² 

Affiliations:

¹School of Nursing Science,
Faculty of Health Sciences,
North-West University,
Potchefstroom, South Africa

²School of Management,
IT and Governance,
University of KwaZulu-Natal,
Pietermaritzburg,
South Africa

Corresponding author:

Olateju Ajanaku,
tejlad@yahoo.com

Dates:

Received: 12 Mar. 2021

Accepted: 01 Sept. 2021

Published: 08 Nov. 2021

How to cite this article:

Ajanaku, O.J. & Mutula, S.,
2021, 'Knowledge
management enablers
affecting patient care: The
perspective of registered
nurses in South West Nigeria',
*South African Journal of
Information Management*
23(1), a1387. [https://doi.
org/10.4102/sajim.
v23i1.1387](https://doi.org/10.4102/sajim.v23i1.1387)

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Background: The productivity of healthcare institutions is impacted by the nursing workforce and plays a vital role in the provision of effective and efficient patient care. Knowledge management plays a vital role in nursing practice. This study seeks to extend the frontier of knowledge by addressing the paucity of literature on knowledge management in nursing care delivery in Nigeria.

Objectives: The study empirically identified crucial knowledge management enablers from extant literature and investigated their influence on patient care in clinical nursing.

Method: A cross-sectional survey design using a stratified sampling method was employed. A self-administered questionnaire was used to collect quantitative data from 196 registered nurses in a selected teaching hospital in South West Nigeria. A total of 186 valid responses were analysed using structural equation modelling (SEM).

Result: The result of this study indicated that there is a direct and significant relationship between information technology (IT) and patient care. Organisational structure and organisational culture did not directly affect patient care. However, together with IT support, the knowledge management enablers were found to significantly affect patient care in clinical nursing.

Conclusion: There is a need for nursing management to develop a flexible organisational structure and knowledge friendly culture including the implementation of functional technical infrastructure, to leverage knowledge management effectiveness in patient care in teaching hospitals in order to facilitate and strengthen service delivery by nurses.

Keywords: knowledge management enablers; organisational culture; organisational structure; information technology; patient care; nurses; hospital; Nigeria.

Introduction

Knowledge is a key asset for performance in a knowledge-based society. Knowledge begins from data, which are considered as raw unanalysed facts. In a given context these data are analysed by people for a particular purpose (Sanders 2016). Akosile and Olatokun (2020) opined that knowledge is regarded as a higher structure of information that has been understood and applied. Knowledge offers an organisation the capacity for informed decision-making and the ability to respond to changing environments. The management of organisational knowledge as a valuable strategic asset has become quite popular and has generated considerable interest in organisations because of its capability to deliver to organisations, strategic results relating to competitive advantage and productivity (Omotayo 2015).

Knowledge management (KM) is increasingly being applied in healthcare institutions because of the heavy reliance on knowledge and evidence-based practice coupled with the huge volume of knowledge that healthcare practitioners must handle (Wickramasinghe & Schaffer 2006). According to Lee (2017), healthcare systems such as hospitals are knowledge-intensive environments and are constantly changing because of the advancements in medical technologies, and as a result generating more knowledge resources that require specialised tools and skills coupled with innovative methods for healthcare delivery. Unlike other organisations, 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 (Kieft et al. 2014). Prior studies in developed countries have revealed that increased sharing of knowledge amongst

healthcare providers, enhanced treatment processes, reduced healthcare costs and improved quality of patient care are amongst the advantages of applying a KM system in hospitals (Koushazade, Omidianpoor & Zohurian 2015).

In hospitals, nurses are a key source of organisational knowledge and important elements of creating internal knowledge, transfer and updating knowledge within the complex clinical environments (Salehi et al. 2015). Prior studies have showed that the inability of nurses to meet the knowledge proficiencies in their clinical practice results in the delivery of suboptimal care to patients (McGlynn et al. 2003). The Nigerian healthcare system is reported as weak and uncoordinated, which is demonstrated by the disintegration of service delivery and deplorable quality of care (Welcome 2011). Akpabio et al. (2016) revealed that organising and utilising knowledge resources to improve patient care delivered by nurses is a challenge in Nigerian health institutions.

The healthcare environment is constantly evolving and changing, requiring expertise, skills and methods with more knowledge resources (Belay et al. 2021; Lee 2017). The efficient management of knowledge in nursing practice is an essential approach in quality healthcare delivery. Therefore, healthcare organisations need to consider developing a proactive strategy such as the application of KM enablers to improve patient care. The KM enablers are essential infrastructure for increasing the efficiency of KM practices (Allameh & Zare 2011). Although previous studies (e.g. Akhavan, Jafari & Fathian 2014; Gold, Malhotra & Segars 2001; Lee 2017; Nguyen 2010) have identified different KM enablers that influence the effectiveness of KM in organisations, empirical work in this area in healthcare institutions remains scarce. The three constructs of KM infrastructure (otherwise enablers) consisting of technology, structure and culture by Gold et al. (2001) are utilised in this study.

It is noteworthy that there is a dearth of empirical studies in KM from the perspective of nurses in Nigeria. This study was conducted to fill the gap in the literature in Nigerian healthcare institutions. The following main question was developed to guide the study:

Do KM enablers such as information technology (IT), organisational structure and organisational culture affect patient care in clinical nursing?

Literature review

Literature abounds with numerous debates regarding what constitutes KM. However, scholars elaborate that KM is a scrupulous approach towards leveraging knowledge to attain organisational goals and improve performance (Barao et al. 2017; Payal, Ahmed & Debnath 2019).

Knowledge management is a set of procedures relevant to knowledge creation, capture and application to improve performance, and has attracted the attention of scholars in the healthcare sector (Kothari et al. 2011).

A great deal of literature has emphasised major and common factors (otherwise called knowledge enablers) regarding managing knowledge in healthcare organisations (Allameh & Zare 2011; Ghosh & Scott 2005; Gold et al. 2001; Wickramasinghe, Rajeev & Elie 2007). However, this article focuses on investigating the influence of KM enablers in nursing care within healthcare organisations.

Knowledge management encompasses many factors, which influence its adoption and implementation in organisations. These factors are called enablers and facilitate organisations to harness the development of their knowledge. Theriou, Maditinos and Theriou (2011) observed that knowledge enablers are influencing factors applied by organisations to consistently develop, improve and use knowledge. Other authors also suggest that KM enablers are organisational strategies and practices that can stimulate and support KM activities in an organisation and contribute to the creation of competitive advantage in organisations (Matin & Sabagh 2015). Gholipour, Gholamrez and Hosseinzadeh (2010) further explained that KM enablers positively affect organisational effectiveness. They include facilitating relationships and collaborations and sharing local knowledge across an organisation or beyond geographic and cultural barriers.

The competitive and constantly changing environment of hospitals requires addressing the quality of care administered to patients (Kieft et al. 2014). The basic mission of a hospital is to deliver quality healthcare services, and it uses highly specialised knowledge to solve healthcare issues. The creation, capture, distribution and use of knowledge are therefore crucial aspects of a hospital's organisational learning and service delivery activities, which are all very critical to a hospital's mission (Ayanbode & Nwagwu 2020).

According to Ghosh and Scott (2006), the benefits of KM in patient care include improvement of service productivity of nursing staff, improvement in the timeliness of patient care, reduction in unnecessary patient transfers or returns and improvement in the overall effectiveness of patient care. In healthcare organisations, the effectiveness of patient care in clinical nursing is determined by the quality of nursing care.

Nurses must have the capability to deliver efficient and effective service based on patient needs and the application of evidence-based practice (Kieft et al. 2014). Existing literature identified different measurement categories for patient care in nursing practice. This includes, but is not limited to, empowerment and work satisfaction (Cicolini, Comparcini & Simonetti 2014), leadership (Shaughnessy et al. 2018), organisational commitment and KM (Ghosh & Scott 2006; Lee, Kim & Kim 2014). From an extant literature review, globally there is a dearth of research in the field of KM in nursing practice. Thus, the purpose of this study was to draw on the recent notions of KM to investigate the relationship between KM enablers and patient care in clinical nursing.

Theoretical framework and hypotheses

We draw on Gold et al. (2001) organisational capability model as the theoretical underpinning to conceptualise KM enablers that are expected to influence patient care in the selected teaching hospital. Gold et al. (2001) model of organisational capability provides a useful organising framework for understanding and investigating the role of organisational capabilities required to leverage knowledge efficiently throughout the organisation. According to this model, the dimensions of knowledge infrastructure and knowledge process are critical organisational capabilities for successful KM. Knowledge infrastructure involves three key dimensions of technology, structure and culture, along with a knowledge process architecture of acquisition, conversion, application and protection. Application of Gold et al. (2001) model to KM research had been advocated in prior studies, for example, Anderson (2009) and nursing (Ghosh & Scott 2005). According to Gold et al. (2001), technology, culture and structure are systematic resources that serve as the source of organisational capability.

The theory was selected because it provided the most comprehensive clarification and context for KM enablers that would best relate to the unique settings of nursing care in Nigeria. The main KM enablers highlighted in previous KM studies include: technology, culture and structure. Thus, these three enablers were the focus of this study, and are described in the following sections and hypotheses are proposed.

Technology

Information technology plays a key role in the integration of knowledge and removing boundaries of communication. The important role of technology comprises the support for the mobilisation of the creation of new knowledge (Al-Omouh, Simón-Moya & Sendra-García 2020). Technology is an essential enabler of KM activities and serves as a repository in which knowledge can be reliably stored and efficiently retrieved (Allameh & Zare 2011; Bharadwaj, Chauhan & Raman 2015). Therefore, IT support is important for KM performance in organisations. Knowledge management solutions in organisations become successful when built on a comprehensive technological platform (Bharadwaj et al. 2015). Technology enables nurses to find, interpret, organise and evaluate information from a variety of sources to better inform decision-making and problem-solving within patient care. In the current healthcare environment, nurses are challenged to incorporate IT into their routine (Markazi-Moghaddam, Kazemi & Alimoradnori 2019).

Structure

The structure of an organisation consists of rules, policies, procedures and processes, the hierarchy of reporting relationships, incentive systems and departmental boundaries that organise designs within the firm (Gold et al.

2001). Gold et al. (2001) further highlighted that organisational structure is the second most critical factor for successful KM in an organisation and envisioned to rationalise different functions within an organisation. The organisational structure reflects how responsibility and tasks are allocated amongst organisational members and the coordination of their different work procedures. The framework and effective performance of key activities in the organisation and staff support is dependent on organisational structure (Vera & Crossan 2004). Flexibility, modularity, policy, rewards and incentive systems are elements of a good organisational structure. The development of knowledge structure in the organisation requires the creation of KM positions such as KM specialists, knowledge programmers, portal managers and content managers (Bharadwaj et al. 2015). Adaptivity, consistency of values, employee engagement and embracing shared mission by organisations facilitate a knowledge friendly environment. A flatter organic, network structure facilitates the transfer and creation of knowledge in organisations, which results in a more activated KM activity (Zheng, Yang & McLean 2010).

Culture

Organisational culture encompasses established values, principles and ideologies that serve as a foundation of the work ethics of members of the organisation (Palthe 2014). Organisations consist of individuals with their unique behaviours, norms and moral standards; the accrual of these unique individuals creates the culture (Allameh & Zarem 2011). Organisational culture is a crucial feature of effective KM (Wong 2005). The function of culture in organisations involves internal coordination and cooperation to gain a competitive advantage. Knowledge management effectiveness requires a supportive culture and acknowledging the importance of KM by organisational members. The establishment of an appropriate culture that consists of values, trust, openness and sociability is essential to encourage KM activities (Auernhammer & Hall 2014). Empirical evidence shows that culture, for example, staff attitudes, behaviours and shared norms influence the performance of healthcare organisations against their stated objectives for quality of care or patient adherence (Mannion, Davies & Marshall 2005). Therefore, in the context of healthcare, it is expected that the positive changes in culture will affect the performance of nurses and accelerate the other improvements in patient care.

Patient care

Patient care is a wide concept consisting of health organisations' practices of providing high-quality care. Although the term patient care has become pervasive and lack of consensus exists on its definition, most researchers agree that patient care is an approach that completely incorporates the patients need, experiences into every stage of medical consultation, treatment and follow-up (Epstein & Street 2011). Nurses constitute the largest percentage of healthcare workers globally, and play a crucial role in healthcare delivery (Salvage & White 2019). Thus, patient care outcomes are also measured

by the quality of nursing care delivered to patients in healthcare institutions. Patient care in this study reflects the utilisation of knowledge resources by nursing professionals in healthcare institutions to fulfil the organisation's vision and deliver optimal care. This study draws on the recent notions of KM to help measure its effectiveness in patient care. According to Simon (2016), the increasing costs and continuous risks in patient care indicate that KM tools have not been fully recognised in healthcare. Research into KM as a factor for improving patient care in nursing practice is in its early stages and there exists a dearth of empirical studies that examine KM enablers in patient care.

Therefore, we hypothesise that:

- H₁: Information technology (IT) has a direct effect on patient care in clinical nursing.
- H₂: Organisational structure has a direct effect on patient care in clinical nursing.
- H₃: Organisational culture has a direct effect on patient care in clinical nursing.
- H₄: KM enablers (IT, organisational structure and organisational culture) have a direct effect on patient care in clinical nursing.

Methodology

Research paradigm

The study employed the positivist paradigm. The positivist paradigm assumes reality as independent of what is being researched and social construction (Creswell et al. 2003). The positivist position is based on the discovery of truth and its presentation by empirical means (Henning, Van Rensburg & Smit 2004).

Population and sampling

The study focused on registered nurses at different cadres from all clinical units in a public hospital in the Southwest region of Nigeria. The population of the study comprised assistant directors of nursing service (ADNS), assistant chief nursing officers (ACNO), chief nursing officers (CNO), senior nursing officers (SNO), nursing officer I and nursing officer II whose total population was 1192. Stratified proportionate sampling was used to recruit respondents according to the clinical units. Out of the 196 questionnaires that were administered, 186 were considered for analysis giving a response of 94.9%.

Instrument

The questionnaire was divided into two parts. Part A captured demographic information from the respondents whilst Part B captured information on KM enablers and patient care. The measurement items of the questionnaire used for the survey were adapted from Gold et al. (2001) for KM enablers and Ghosh and Scott (2005) for patient care. The questionnaire was constructed according to the research hypotheses, KM enablers were operationalised using three dimensions: IT support, organisational culture and organisational structure.

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. The questionnaire was evaluated for content validity by two experts in the field.

Ethical considerations

In keeping with research ethics, approval for the study was obtained from the ethics committee of the selected hospital and other relevant bodies. Written consent was also obtained from the respondents.

Data analysis

The Statistical Package for the Social Sciences (SPSS) version 26 for Windows was applied to conduct descriptive statistics and confirmatory factor analysis (CFA). Measurement and structural models were established using RStudio version 0.97.551. Hypothesized relationships between latent variables were tested. These two steps in structural equation modelling (SEM) analysis based on the recommendations by Hair et al. (2006) were utilised.

Results

The results of the study are presented in the sections that follow.

Data cleaning and test of assumptions

Missing data, outliers and reliability tests were checked through the descriptive and data screening phase. Maintaining close contact with the respondents is necessary as we intended to reduce non-response bias, which may likely emanate from the respondent's unwillingness to complete copies of the questionnaire. There is no sign of univariate or multivariate outliers in the data set. There is a sign that the assumption of multivariate normality is not met. The result of the Mardia's test (Mardia 1970) of multivariate normality reveals that the Mardia's normalised coefficient for multivariate kurtosis is 61.809 and skewness is 12 858.575 accompanied by a $p < 0.001$, which is statistically significant at 1% significance level, indicating violation of multivariate normality. The fact that our data set does violate multivariate normality is not surprising as it is recognised that multivariate normality of observed variables is rarely satisfied in practice (Lei 2009; Micceri 1989). Consequently, we employed the robust maximum likelihood estimator (MLR), also known as the Satorra–Bentler rescaling method, to evaluate the model. The MLR as an alternative to the maximum likelihood (ML) estimator ensures that we have robust parameter estimates and standard errors for our CFA and the covariance-based SEM (CB-SEM), respectively (Rosseel 2012).

Reliability and validity

The reliability and validity of the questionnaire were appraised by examining the equivalence measure of reliability, the convergent and construct validity and the factorability of

the data. The measure of the reliability of the constructs was assessed by testing Cronbach’s alpha coefficient, which reflects the internal consistency of the measure and homogeneity of the items in the scale (Al-Omoush et al. 2020). Internal consistency and reliability of the constructs were measured using Cronbach’s alpha. The coefficient was above the generally accepted threshold of 0.70. Also, the results, composite reliability, McDonald’s omega reliability coefficient and ordinal reliability coefficient test (see Table 1) for each construct are within the acceptable thresholds of above 0.7 and not higher than 0.95 (Hair et al. 2016).

As presented in Table 2, applying a threshold value of 0.85, discriminant validity is established because none of the values in the correlation matrix exceeds 0.85. To confirm the accuracy of the discriminant validity, we also apply the heterotrait–monotrait ratio (HTMT_{0.85}) method, which is an estimate of the correlation between constructs, paralleling the dis-attenuation construct score criterion (Henseler et al.

2015; Mamun et al. 2018). The descriptive statistics, which include the means, standard deviation, average variance extracted (AVE) and intercorrelation amongst constructs are displayed in Table 3. The convergent validity of the constructs is determined by examining the AVE. The results in Table 3 reveal that the AVE ranges from 0.528 to 0.613, which is above the recommended minimum of 0.5 (Fornell & Larcker 1981).

The factorability of the data was tested by applying Kaiser-Meyer-Olkin (KMO) and Bartlett’s test of sphericity (BTS). Maat et al. (2011) highlighted that the KMO test and BTS determine whether the adequacy of sampling was adequate to proceed with factor analysis. The suitability of factor analysis was supported by BTS. The KMO value for each variable was above 0.6 with a significant BTS value. A KMO value as recommended by Field (2003) closer to 1 is good, 0.6 is acceptable and less than 0.6 is mediocre. The details of principal component analysis (PCA), KMO and BTS are summarised in Table 4. Overall, these statistics indicate that the psychometric properties of the model are adequately robust for conducting SEM.

TABLE 1: Construct measurement summary.

Construct	Measurement item	Standardised factor loadings	t
IT support (IT) CR = 0.910 ω = 0.884 OR = 0.923 α = 0.906	Collaboration with other clinical staff in the organisation	0.786†	-
	Mapping of the location of a specific type of knowledge	0.805	17.393***
	Search for new clinical knowledge	0.818	16.631***
	Retrieve and use knowledge about its clinical processes	0.704	10.206***
	Generation of new clinical processes in conjunction with other health institutions	0.647	10.206***
Organisational structure (OS) CR = 0.860 ω = 0.833 OR = 0.907 α = 0.853	Monitoring of clinical processes	0.832	11.156***
	Support for communication amongst the nurses and other clinical staff	0.782	11.822***
	Manages frequently and examine clinical knowledge for errors/mistakes	0.594†	-
	The structure facilitates the creation of new knowledge across structural boundaries	0.727	6.205***
Organisational culture (OC) CR = 0.786 ω = 0.804 OR = 0.860 0.775	The structure facilitates the discovery of new clinical knowledge	0.962	6.000***
	Designs processes to facilitate knowledge exchange across functional boundaries	0.802	5.880***
	Nurses understand the importance of knowledge to clinical success	0.720†	-
Patient care (PC) CR = 0.847 ω = 0.835 OR = 0.901 α = 0.840	High levels of participation are expected in capturing and transferring knowledge	0.887	6.197***
	On the job training and learning are valued	0.604	6.166***
	Improve the timeliness of patient care	0.668†	-
	Improve the overall effectiveness of patient care	0.673	-
	Reduces unnecessary patient transfer or returns	0.838	10.911***
	Responsive to complaints from patients and families	0.752	6.732***
	Improves the service productivity of nursing staff	0.687	7.170***

CR, composite reliability; α, Cronbach’s alpha; ω, McDonald’s Omega reliability coefficient; OR, ordinal reliability coefficient.

†, denotes a constrained relationship to 1.00 to ensure model identification.

***, implies that all the factor loadings have a p < 0.001.

TABLE 2: Discriminant validity.

Variable	IT	OS	OC	PC
Fornell and Larcker’s matrix				
IT	0.770	-	-	-
OS	0.289	0.783	-	-
OC	0.002	0.004	0.746	-
PC	0.144	0.005	0.004	0.727
The heterotrait–monotrait ratio				
IT	1.000	-	-	-
OS	0.511	1.000	-	-
OC	0.007	0.101	1.000	-
PC	0.413	0.116	0.112	1.000

Source: SPSS version 26 output

Note: Square root of the AVE (boldfaced); Off diagonal values are the squared correlation between construct

IT, information technology; OS, organisational structure; OC, organisational culture; PC, patient care.

TABLE 3: Descriptives and correlations for the constructs.

Variable	Intercorrelation of constructs						
	Mean	s.d.	AVE	1	2	3	4
Information technology	3.682	1.024	0.593	1.000	-	-	-
Organisational structure	3.910	0.714	0.613	0.538***	1.000	-	-
Organisational culture	4.162	0.689	0.557	-0.049	-0.061	1.000	-
Patient care	4.107	0.666	0.528	0.380**	0.068	-0.063	1.000

Note: The mean and s.d. are based on arithmetic average of items scores measuring respective latent variables.

AVE, average variance extracted; s.d., standard deviation.

, p < 0.05; *, p < 0.001.

TABLE 4: Kaiser-Meyer-Olkin and Bartlett’s test of sphericity.

Variable	Kaiser-Meyer-Olkin (KMO)	Bartlett’s test of sphericity (BTS)
Information technology support	0.888	χ ² = 605.238; df = 28; sig = 0.000
Organisational structure	0.806	χ ² = 256.072; df = 21; sig = 0.000
Organisational culture	0.702	χ ² = 255.743; df = 15
Patient care	-	χ ² = 219.664; df = 10; sig = 0.000

p, 0.000.

Measurement model

The CFA was conducted to determine the measurement fit of our model. The results reveal that each item loads on their respective primary constructs except one item from the IT support construct, three items from the organisational structure construct and three items from the organisational culture construct that is dropped for displaying low loadings. According to the results, the standardised factor loadings of the items in the CFA model are all above 0.59. The overall model fit statistics (Table 5) reveals that the measurement model (Figure 1) supports the data very well as all the model fit statistics are above the recommended cut-off values.

Structural equation model

The fit of the measurement model was found to be satisfactory based on these results, the structural model was then specified and evaluated to examine the theoretical links amongst the latent variables. The results of SEM showed that the adequacy fit of structural model based on the goodness-of-fit indices as follows: $\chi^2 = 251.162$, $df = 146$, $CMIN = 1.720$, $CFI = 0.930$, $TLI = 0.918$, $GFI = 0.992$, $RMR = 0.038$, $RMSEA = 0.062$ and $p = 0.000$. Given the large sample size, these results supported the overall structural model fit (Figure 2). 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 hypotheses.

Validation of research hypotheses

Concerning the structural relationships proposed in the hypothesised model, the results in Table 6 reveal that IT support has a significant and positive effect on patient care in clinical nursing ($\gamma_{11} = 0.482$, $z = 2.968$, $p < 0.05$); therefore, H_1 is supported. Organisational structure has a non-significant and negative effect on patient care in clinical nursing ($\gamma_{12} = -0.195$, $z = -1.634$, $p > 0.05$); therefore, H_2 is not supported. Organisational culture has a non-significant and negative effect on patient care in clinical nursing ($\gamma_{13} = -0.051$, $z = -0.634$, $p > 0.05$); therefore, H_3 is not supported.

TABLE 5: Fit indices of the measurement model.

Index	Acceptable value	Actual value
Chi-square (χ^2)	-	251.162
Degree of freedom (df)	-	146
CMIN/DF	< 3 = good fit	1.720
TLI	≥ 0.90 and ≤ 0.94 = good fit ≥ 0.95 = very good fit	0.918
GFI	≥ 0.90 and ≤ 0.94 = good fit ≥ 0.95 = very good fit	0.992
RMR	< 0.08 = good fit	0.038
CFI	≥ 0.90 and ≤ 0.94 = good fit ≥ 0.95 = very good fit	0.922
RMSEA	< 0.08 = good fit	0.062

Source: RStudio version 0.97.551

CMIN/DF, value of chi square divided by degree of freedom; TLI, Tucker Lewis Index; GFI, Goodness of Fit Index; RMR, Root Mean Square Residual; CFI, Comparative Fit Index; RMSEA, Root Mean Square Error of Approximation.
 $p, 0.000$.

Overall, the explained variance for the dependent variable patient care is about 17%.

Concerning the effect of KM enablers on patient care in clinical nursing, we computed and saved the factor scores for each of the four latent variables: IT, organisational structure (OS), organisational culture (OC), patient care (PC). We then calculated the average of IT, OS and OC to form a single variable to capture KM that is further used for path analysis. The results in Table 7 reveal that KM has a statistically significant and positive ($\beta = 0.287$, $z = 4.071$, $df = 185$, $p \leq 0.001$) effect on PC. Hence, H_4 is supported. Overall, the explained variance for the dependent variable patient care is about 8%.

Discussion

The study was conducted to examine the direct effect of KM enablers on patient care from the perspective of nurses in a selected public teaching hospital located in the South West Nigeria. A theoretical model was proposed, which was underpinned by Gold et al. (2001) organisational capability theory. The study hypothesised that IT support, organisation structure and organisational culture as components of KM enablers will have a significant and direct effect on patient care in clinical nursing. The model was examined by the CFA method to test how well the measured variables represent the number of constructs.

The first hypothesis (H_1) sought to determine the effect of IT support on patient care in clinical nursing. Findings indicated that IT support has a significant and direct effect on patient care. In other words, the results of this study provide evidence that IT support plays a considerable role in KM effectiveness in nursing care roles in the selected teaching hospital under study in South West Nigeria. This is consistent with previous studies that reported the benefit of IT use by nurses and their contribution to quality clinical care (Ghosh & Scott 2006; Nguyen et al. 2009; Ajanaku & Mutula 2018). This study affirms that the use of IT has become a major tool in the delivery of health services in the selected hospital in Nigeria

TABLE 6: Validation of research hypotheses $H_1 - H_3$.

Hypothesis	Relationship	Standardised estimate	z	Decision
H_1	IT support -> Patient care	0.482	2.968**	Supported
H_2	Organisational structure -> Patient care	-0.195	-1.634	Not supported
H_3	Organisational culture -> Patient care	-0.051	-0.634	Not supported

Source: RStudio version 0.97.551 output

IT, information technology.

** $, p < 0.05$.

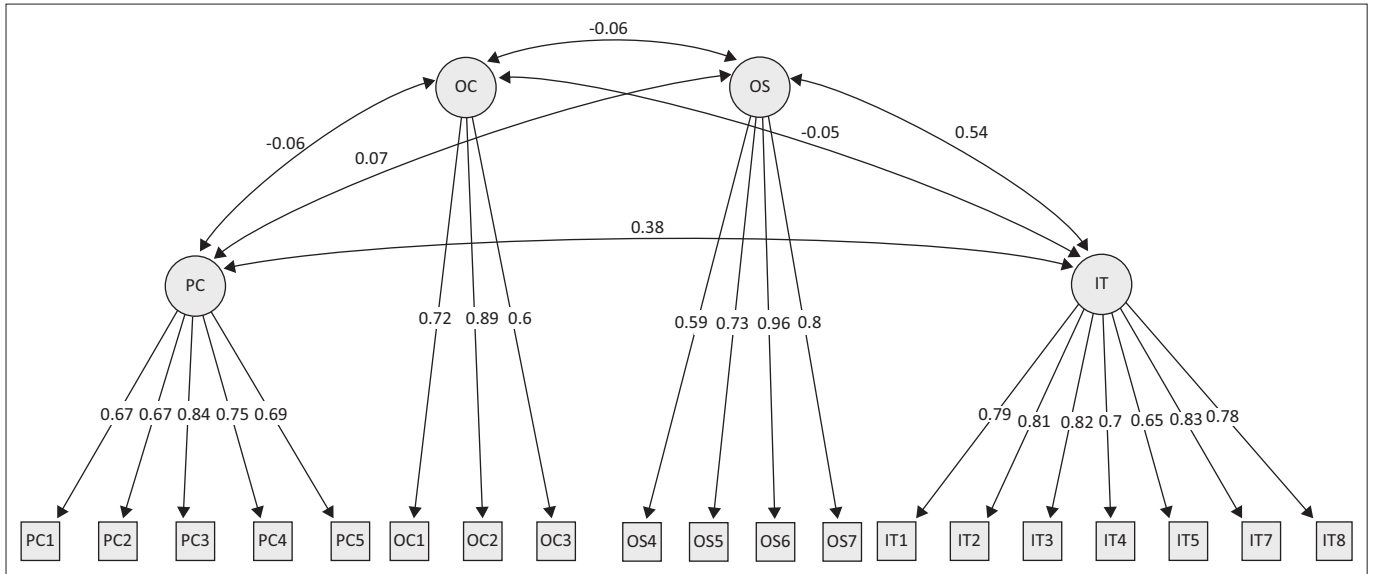
TABLE 7: Validation of research hypothesis H_4 .

Independent variable	Dependent variable		z
	PC		
	Direct effect	Upper bound/lower bound	
KM	0.287	[0.179/0.508]	4.093***

Source: RStudio version 0.97.551 output

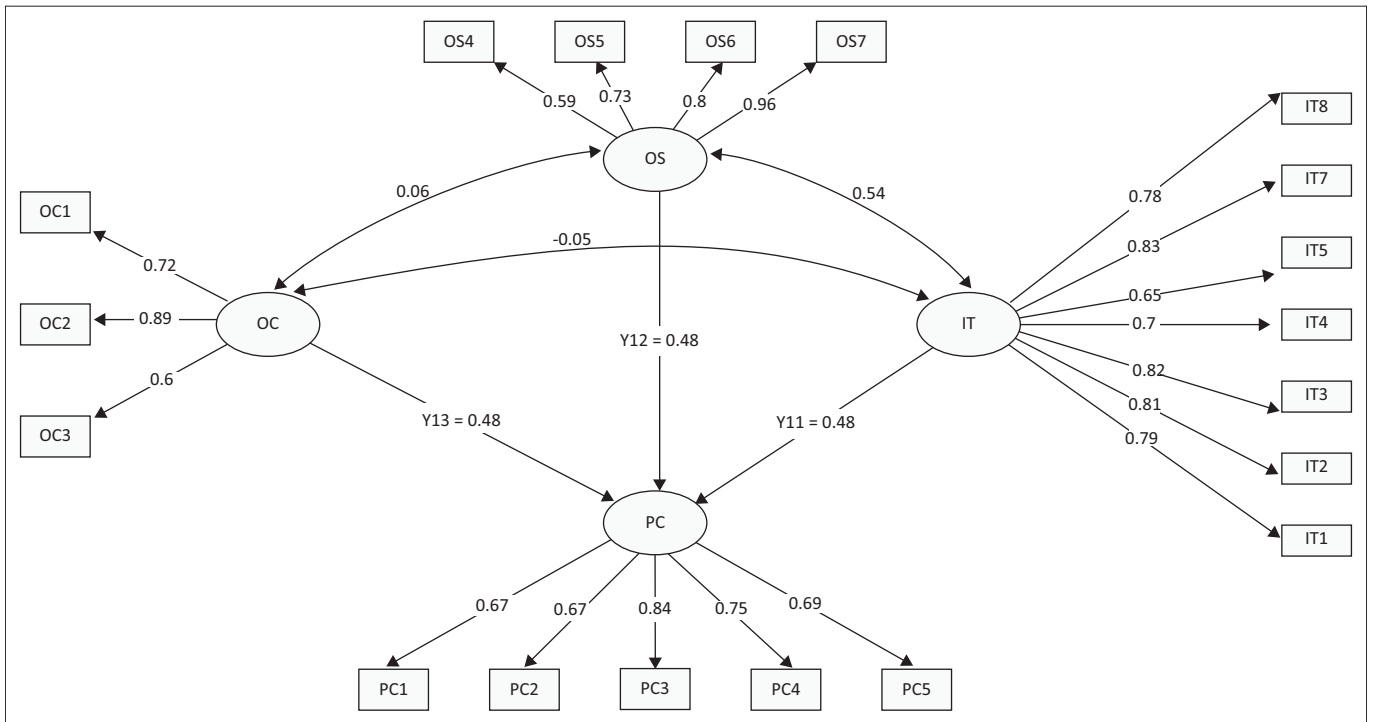
KM, knowledge management; PC, patient care.

*** $, p < 0.001$.



Source: RStudio version 0.97.551 output

FIGURE 1: Measurement model.



Source: RStudio version 0.97.551

FIGURE 2: Structural equation model.

and nurses need to engage fully in IT use for effective and efficient patient care. The findings of this study also lend credence to the study of (Mutula 2015) that revealed nurses recognise the value of IT in improving patient care and if well integrated into healthcare services, would substantially enhance the services provided by nurses.

The second hypothesis (H_2) investigated the effect of organisational structure on patient care in clinical nursing. Based on the findings, organisational structure has no positive effect on patient care in clinical nursing. This is quite consistent with the findings of Nguyen (2010) who reported that structural

elements of KM infrastructure have no significant direct contribution to organisational performance. This argument is further supported by many studies such as that of Waluyo and Wibowo (2011) who reported that structure is not directly related to organisational performance. Previous literature also reported mixed findings such as that of Anderson (2009) who investigated organisational capabilities as predictors of effective KM using organisational capability theory. The findings revealed that organisational structure had a direct influence on organisational effectiveness whilst organisational culture had no direct influence. The hospital organisational structure must be designed for flexibility so that they can

encourage knowledge sharing, collaboration and learning because the coordination amongst units and departments occur frequently through informal communications.

The third hypothesis (H_3) determined the effect of organisational culture on patient care in clinical nursing. Results showed that organisational culture has no direct effect on patient care. This result contradicts the study of Nguyen et al. (2009) which reported that organisational culture makes a significant contribution to an organisation's performance. However, this study agrees with Waluyo and Wibowo (2011) who reported that organisational culture is not directly related to organisational effectiveness. These findings highlight the need for teaching hospitals to incorporate a supportive culture such as shared knowledge, experiences and values which are critical enablers and success factors for KM. Knowledge sharing and supportive cultural influences such as ethical values, excellence in care delivery, professionalism, strategic thinking, continuous learning, team collaboration, commitment to quality have been found to contribute to the quality of care (Ghosh & Scott 2006).

Finally, the fourth hypothesis (H_4) investigated the direct effect of the combination of the KM enablers (IT, OS and OC) on patient care in clinical nursing. The findings also indicated that the KM enablers had a direct relationship with patient care. This result validates the findings of previous studies such as that of Martinez-Conesa, Soto-Acosta and Carayannis (2017), Pandey and Dutta (2013) and Rasula, Vuksic and Stemberger (2012). The current finding supports the report of Nguyen (2010) and Matin and Sabagh (2015) as they highlighted organisations need to leverage KM enablers, thereby improving performance. In the light of the results obtained, although the organisational structure and organisational culture in the studied hospital did not directly influence patient care in clinical nursing, the effect is seen when it combined with IT support. Teaching hospitals need to leverage KM enablers to facilitate the enhancement of nursing services thus, simultaneously improving patient care.

Limitations of the study

The study focused on the registered nurses in a selected public teaching hospital in South West Nigeria. Thus, generalisability to other nursing populations and private hospitals may be controversial. To generalise findings, more samples are needed from other healthcare settings.

Implication

The present study suggests that investment in KM in healthcare would lead to improved patient care in nursing practice. The findings of this study confirm a collaborative relationship between the studied KM enablers (IT support, organisational structure, organisational culture), which significantly influenced patient care. This provides essential insights into stakeholders and nursing directors to develop a comprehensive approach towards the

adoption of holistic KM enablers (IT, culture, structure). These enablers need to be integrated with quality healthcare. Healthcare managers must endeavour to put in place KM policy that underlines the technical, structural and cultural-related factors essential for the implementation of KM systems.

Conclusion and recommendation

This article concludes that stakeholders and nursing directors in teaching hospitals should give enough emphasis to KM for the improvement of patient care. The promotion of knowledge-based culture with a flatter structure should also be taken into consideration. Knowledge management activities such as seminars and workshops, which encourage collaboration should be implemented to promote a learning culture and trust in different departments. In this way, nurses can get more familiar with KM concepts and their benefits. The strength of this study is that it evaluated for the first time the effect of KM enablers on patient care in nursing roles in a selected public teaching hospital in South West Nigeria using SEM.

Acknowledgements

Competing interests

The authors have declared that no competing interest exist.

Author's contributions

O.J.A. conceptualised the study, developed, collected the literature used in this study and did the write-up of the article. S.M. supervised the study, and was also involved in writing and reviewing of the article.

Funding information

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors, and the Publisher/s.

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