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FEATURE

Predictors of Knowledge Management in Healthcare Organizations in Butembo

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Abstract. *Having the right knowledge to act and decide has become very crucial in the 21st century and particularly for healthcare organizations where medical errors can cause millions of injuries (Ghosh & Scott, 2006). Effective knowledge management (KM) improves the quality of care provided by medical doctors and nurses. This research intended to assess the effect of change readiness, organizational culture, organizational ethical climate, and KM processes on KM effectiveness in healthcare organizations. Questionnaires were distributed to 220 nurses and physicians from Butembo, one of the towns in the eastern part of the Democratic Republic of Congo. One hundred thirty respondents returned the questionnaires, among which 117 were found valid. Multiple regressions were done to test the research hypotheses. The analysis revealed that structural readiness and organizational culture predicted KM processes. Structural readiness and KM processes predicted KM effectiveness. However, psychological readiness failed to predict KM processes and KM effectiveness. The findings suggested that hospitals should foster a culture of learning, risk-taking, and team-working to provide appropriate services to patients. They should also invest in developing KM processes such as knowledge acquisition and sharing.*

Keywords: knowledge management processes, knowledge management effectiveness, change readiness, organizational culture, Butembo, Democratic Republic of Congo

Introduction

The healthcare industry is among the most knowledge-intensive sectors in the world, where change is constant (Abidi, 2008; Pavia, 2001). Healthcare knowledge constantly changes due to new diseases (Chen, Liu, & Hwang, 2011), the increase in antimicrobial resistance (Eliakimu, 2016; Popescu, Neudorf, & Kossey, 2016), and the development of diverse medical procedures and pharmaceutical drugs (Dwivedi, Bali, & Naguib, 2007). For instance, Pavia (2001) reports that healthcare professionals have to deal with "10000 known diseases, 3000 drugs, 1100 lab tests, 300 radiology procedures, 1000 new drugs, and biotechnology medicines in development, [and] 2000 individual risk factors" (p.12). Also, several health-related conventions enacted by governments and various organizations have to be followed during patient treatment (Chen et al., 2011; Kothari, Hovanec, Hastie, & Sibbald, 2011). The result has led to information overload (Dwivedi et al., 2007) and increased pressure for healthcare practitioners to be constantly updated about the use of new medicaments, prescriptions, and treatments (Abidi, 2008). They have to depend on diverse internal and external sources to get the right information for optimal patient care. Physicians and nurses may use inefficient medicaments, follow inappropriate clinical practices, and take incorrect clinical decisions, without adequate healthcare knowledge (Abidi, 2008). Pavia (2001) stresses, for instance, that approximately a hundred thousand people die every year due to medical malpractices. Therefore, there is a need that knowledge scattered in patient's records, policies, medical publications, and the know-how of physicians and nurses, including patients, be strategically managed for the benefice of the whole organization.

Knowledge management (KM) provides a system efficient enough to acquire, create, store, and disseminate timely the right knowledge to people in need of critical information (Dwivedi et al., 2007; Myers, 2016). It can assist healthcare organizations to access and use internal and external knowledge efficiently, adapt to unplanned changes, take advantage of new clinical services, and prevent unnecessary transfers and treatments (Ghosh & Scott, 2006). Also, Kothari et al. (2011) highlight the importance of acquiring, sharing, and using healthcare knowledge in the daily activities of nurses and medical doctors. These activities become critical in developing countries, such as the Democratic Republic of Congo, characterized by lack of adequate infrastructure (Sion et al., 2015), poor healthcare education system, and with most clinical knowledge exclusively known only by nurses, and other medical specialists and technicians (Gosh & Scott, 2006).

However, despite the potential advantages of KM systems, many KM initiatives have failed (Chua & Lam, 2005; Akhavan & Pezeshkan, 2014), which represent 50% of KM projects (Ambrosio, 2000). For Chua and Lam (2005), the reasons behind such a rate of failure include technological, cultural, and content-related factors. Aujirapongpan, Vadhanasindhu, Chandrachai, and Cooparat (2010)

also highlight that successful KM needs committed employees. If employees are not prepared for the change, they will challenge it (Walinga, 2008). Hence, Rusly, Corner, and Sun (2012) hypothesized that both the organization and its workforces need to be structurally and psychologically prepared for the new change. They further argue that the construct change readiness has been neglected in studies about KM.

Therefore, this paper has two main objectives. It seeks to determine first how healthcare professionals perceive the structural and psychological readiness of healthcare organizations for KM in Butembo. The second is to find the predictors of KM processes and KM effectiveness with an emphasis on change readiness. Understanding the connection between change readiness (structural and psychological readiness) and KM can be very useful for healthcare practitioners who are trying to provide better healthcare services by using all the available knowledge.

Review of the Literature

Serenko (2013) reviewed 108 scientometric studies on KM. He suggested that generated models from diverse research should be tested using empirical data. Hence, this study aimed to test the model developed by Rusly et al. (2012) in the health sector. Specifically, the study tries to assess the effect of change readiness in terms of structural and psychological readiness, organizational ethical climate, and organizational culture on KM processes and KM effectiveness. This section develops the theoretical background of the main variables of the study.

Theoretical Background

Researchers have examined KM using different theoretical models. Dalkir (2011) presents a succinct summary of different models that serve as the foundation of the KM literature, including the Von Krogh and Roos model and the Nonaka and Takeuchi model. The Von Krogh and Roos model highlights that knowledge is found in the mind of people and in the interactions they have with each other. The model asserts that employees, communication, structure, organizational members' relationships, and the way human resources are managed influence the successful management of organizational knowledge.

Nonaka and Takeuchi's model explains how tacit knowledge and explicit knowledge are integrated with organization knowledge. The creation of knowledge starts with individuals and moves from people to the whole company or from the company to employees via knowledge conversion. Knowledge conversion occurs through "socialization, externalization, combination, and internalization" (Dalkir, 2011, p. 66). Socialization facilitates the sharing of implicit knowledge among people via social interactions, observation, and imitation. Externalization converts knowledge from tacit to explicit using means such as manuals and models. The

combination creates new explicit knowledge based on existing ones. Finally, internalization occurs when explicit knowledge is embedded in individual mental models to create new tacit knowledge. These two models highlight how knowledge is produced and disclosed and the factors that may influence its successful management in an organization.

Gold, Malhotra, and Segars's (2001) model highlights that the knowledge infrastructure and knowledge process capabilities affect the management of knowledge in organizations. Culture, technology, and structure determine the knowledge infrastructure. Knowledge process capabilities derive from the organizational processes and mechanisms to acquire knowledge, convert it into the right format, use it, and protect it against theft and tampering. The model highlights the interrelationships between the two capabilities and their influence on the effectiveness of KM at the organizational level.

Gosh and Scott (2006) validated Gold et al. (2001) model using mixed methods in the healthcare organization. They found that KM infrastructure capability significantly affected KM effectiveness than KM process capability. For KM infrastructure capability, culture played a more significant role than technology. Knowledge application and acquisition were more significant than knowledge conversion and protection in determining KM process capability.

Rusly et al. (2012) developed a model that emphasizes the role of change readiness in KM effectiveness. The model stresses how change readiness can affect the individual or organizational acquisition, creation, and sharing of knowledge. Change readiness encompasses both the psychological and structural aspects of the organization. Individual beliefs are aligned with the organizational structure for a positive implementation of KM processes. Rusly et al. (2012) argue that when the processes that manage knowledge are enacted successfully, KM becomes effective.

Knowledge Management Processes

Different authors have suggested different terms to indicate KM processes. Their definitions of KM provide generally these processes. For instance, Myers (2016) defines KM as "a formal approach to acquiring, creating, codifying, storing, sharing and using contextualized information, expertise and other intellectual assets to support achieving an objective" (p. 30). That definition highlights six main KM processes: acquisition, creation, codification, storage, sharing, and use. Becerra-Fernandez and Sabherwal (2015) underline four processes of KM: knowledge discovery, capture, sharing, and application. The discovery process allows the generation of new knowledge based on the combination of existing knowledge or interaction with experts and other employees. The capture process allows employees or organizations to capture knowledge existing in the minds of people or from diverse sources within the organization. The sharing process allows the knowledge to be shared in the right format with people who need it using strategies such as exchange and socialization. Finally, the application process

involves the use of knowledge to guide decision making and task accomplishment by providing directions and routines to follow.

Rusly et al. (2012) highlight three main processes: acquisition, creation, and sharing. These processes underline how knowledge is acquired, shared, and used in the organization. The authors indicate that knowledge acquisition involves "the identification, discovery, and accumulation of knowledge" (p. 337). Knowledge creation refers to the Nonaka processes of knowledge externalization and internationalization. Externalization needs the transformation of tacit knowledge to explicit knowledge, while internationalization refers to the opposite action. These two steps refer to knowledge creation. Finally, the authors combine the idea of sharing knowledge and using knowledge. They argue that knowledge can be used efficiently in the organization if it has been shared. This study concentrated on the KM processes that encompass acquisition, creation, storage, and sharing of knowledge.

Knowledge Management Effectiveness

There are several definitions of KM effectiveness. They reflect what each writer considers as a successful implementation of KM. Zheng, Yang, and Mclean (2010) argue that KM effectiveness occurs when the combined effects of knowledge generation, sharing, and utilization are reached. For Rusly et al. (2012), KM will be effective if it allows the use of the most appropriate KM activities and facilitate decision making.

Myers (2016) suggests a multidimensional definition of KM effectiveness, which considers three organizational entities: the enterprise, the organization, and the individual. They consider an effective KM as a system that generates outcomes that "are more beneficial than detrimental to the organization's goals, capabilities, and resources" (Myers, 2016, p. 32). This occurs at the enterprise level when KM outcomes meet or go beyond the expectations of the allocators of the resources to the project. It is effective at the organizational level when the system continually supports KM activities and associated processes. Finally, an effective KM at the individual level occurs when people involved in it are satisfied with the results. This research focused on the individual dimension of KM effectiveness.

Becerra-Fernandez and Sabherwal (2015) argue that KM processes can influence the organization and its performance by assisting in the creation and availability of knowledge that affects employees' performance, enhances the organizational processes and products and leads to the overall performance of the organization. KM helps employees in different ways, including learning new skills, accessing new knowledge, greater preparedness for change, and job satisfaction (Becerra-Fernandez & Sabherwal, 2015). It affects organizational processes such as accounting and marketing by enhancing their effectiveness, efficiency, and innovativeness. It helps the organization to use the right processes for the organization, reduces the cost of knowledge accessibility, and enhances new ideas

use. KM affects products by leading to the improvement of old products and the development of new ones. KM can affect directly and indirectly organizational performance. The effect is direct when KM helps to create profitable new products and align with organizational business strategy. The effect is indirect when it helps to achieve an economy of scale and provide a sustainable competitive advantage. Hence, KM effectiveness will occur depending on the organization if these different aspects have been reached.

Although the aim to invest in KM is to increase organizational efficiency and performance in decision making, standardized measures of KM effectiveness are still limited (Peachey, 2006; Myers, 2016; Rusly et al., 2012). The work of Rusly et al. (2012) provides measurements that have been used, including "satisfaction with knowledge availability, process, and activities; . . . perceived usefulness of knowledge; and higher perceived service benefits" (p. 345). The present study assessed KM effectiveness by using employees' satisfaction with the availability of knowledge and its management and sharing.

Change Readiness, Knowledge Management Processes, and Knowledge Management Effectiveness

Change readiness is a multileveled construct (Weiner, 2009). It can occur at the organizational or individual level (Rusly et al., 2012). Change readiness is reflected, at the organizational level, in the presence of institutional and financial resources, the way organizational technology is used, and the culture and climate that prevail in the organization (Rusly et al., 2012). For Weiner (2009), change readiness denotes both the magnitude to which the organization is inclined to implement the change and its perceptions of the existence of collective abilities to do so.. The perceptions of the presence of capabilities are contingent on the change requirements, the availability of resources, and diverse factors proper to the current situation (Weiner, 2009). When employees perceive that the organization is prepared for the transformation it promotes, they will likely be highly involved and this likely will affect the extent of change implementation.

At the individual level, readiness for change involves diverse factors, including "motivation, competence, and personality attributes" (Rusly et al., 2012. p. 330). The organization can have all the resources and finances, even the right culture. However, if the employees are not motivated and they feel they lack the required competence, the probability of implementing the required changes will shrink. Hence, it is important to consider both the readiness of the employees and the organization before the implementation of any change such as KM.

Change readiness also is a multifaceted construct. According to Rusly et al. (2012), it involves a psychological dimension and a structural dimension. The psychological aspect of change represents the individual and collective beliefs of a successful organizational change. The factors that play at the personal level include "discrepancy, change appropriateness, change efficacy, principal support, and

change valence" (p. 333). Employees must perceive the need for change due to the existence of a difference between the desired performance of the organization and the current situation. The difference will lead to a sense of urgency to change the organization from the current situation to a better one. Once employees perceive the importance of the change, they must perceive that the proposed solution is appropriate to lessen the gap between the observed and desired organizational performance. The proposed change must solve the problem or weakness. Employees must also believe that they possess the skills and abilities to implement the proposed change. This refers to the efficacy aspect of the psychological dimension. The support of direct supervisors and senior managers of the organization will influence the employees' desire to embrace or not change. If employees perceive that the leaders provide a lips-support, they will not embrace the change. The last factor, valence, refers to the internal and external personal benefits that can be derived from implementing the change. The psychological dimension of change at the organizational level involves mutual commitment and mutual efficacy. Employees must share a common desire to implement the change and must perceive that as a team, they possess the required skills to embrace the new change.

The structural element is the second facet of change readiness (Rusly et al., 2012). The structural dimension encompasses both the individual and the organization. The factors that define individual structural readiness include innovativeness, adaptability, and professional growth. Employees with a high propensity to embrace new ideas, adapt to a new environment, and strive to develop themselves will likely be ready to embrace any change that comes to their ways. The organizational structural readiness is portrayed by good communication in the organization, the opportunity to participate in changing initiatives, clarity of vision, and a learning-supportive organization. Accordingly, when employees are continually learning new skills within the organization, they will be ready to embrace any change the organization proposes to implement.

Change readiness has been conceptually linked to the components of the KM processes. Rusly et al. (2012) linked change readiness and KM processes. They hypothesized that organizational preparedness for change affects the way individual and organization embraces knowledge creation, acquisition, and sharing. Siemieniuch and Sinclair (2004) argue that before finding the appropriate way to implement KM processes, it is vital to assess if the organization is ready for KM by creating a fitting context for KM. For Vakola (2013), change readiness appears at three levels: the individual (represent the positive attitude of the individual towards change), the group or team (capacity of the group to change), and the organizational level (the organization's capability to carry out the change). He emphasizes that "individual or organizational change will be facilitated by a high level of individual readiness to change, which is … shaped by the organizational and change context" (p. 98). As such, one of the goals of this study is to empirically link change readiness and KM processes. Zelenkov (2018) also

emphasizes that since changes are inherent in organizations, then readiness for change is a fundamental factor that affects the effectiveness of the organization. Based on the aforementioned discussion, the following hypotheses are suggested:

1. Hypothesis 1. Change readiness (psychological and structural) has a direct effect on KM processes.
2. Hypothesis 2. Change readiness (psychological and structural) has a direct effect on KM effectiveness.

Organizational Ethical Climate, Knowledge Management Processes and Knowledge Management effectiveness

Tseng and Fan (2011) define organizational ethical climate as "an individual's perception of ethical procedures, policies, and behaviors in the organization" (p. 330). It reflects organizational accepted and shared behaviors, norms, and values (Newman, Round, Bhattacharya, & Roy, 2017). These factors influence individual decision making and ethical behavior and the implementation and realization of different organizational strategies and objectives. In a meta-analysis that assessed the antecedents and outcomes of ethical climate, Newman et al. (2017) found that ethical climate was influenced by a leader's behaviors, national culture, industry sector, individual differences, and organizational, managerial, and leadership practices. The ethical climate also affected many different variables, including job performance, customer satisfaction, financial performance, organizational commitment, and ethical behavior. Although KM was not specifically highlighted in the findings, ethical climate affected work behaviors, teamwork, and performance outcomes. For instance, De Long and Fahey (2000) argue that a climate of trust between the corporation and its employees will affect the amount of knowledge flowing within the organization.

Several studies have evaluated how ethical climate affected KM processes. Tseng and Fan (2011) investigated the effect of ethical climate on both KM attitude and participation in organizational KM practices and found that a strong ethical climate influenced both the attitude toward and participation in organizational KM practices. Akhavan, Ramezan, and Moghaddam (2013) used the Nonaka and Takeuchi model to assess the impact of the ethical climate on KM processes. They discover that ethical principles had a positive impact on the KM process. The relationships were significant for externalization, socialization, and combination while being insignificant for internalization. Hence, one can consider that the organizational ethical climate is an influential variable in KM. Therefore, the following hypotheses are developed:

1. Hypothesis 3. The organizational ethical climate has a direct effect on KM processes.
2. Hypothesis 4. The organizational ethical climate has a direct effect on KM effectiveness.

Organizational Culture, Knowledge Management Processes and Knowledge Management Effectiveness

Each organization has a culture. It is the most important success factor that facilitates organizational change (Ho, Hsieh, & Hung, 2014). Myers (2016) argues that organizational culture creates a group identity by the alignment of individual values with organizational objectives. However, culture is also a major hindrance to effective KM (Gold et al., 2001). As KM is people-based, Chong (2006) suggests that forming a knowledge-friendly culture, a culture where information sharing is considered as power and rewarded accordingly, will ensure KM successful implementation. But, if the culture does not encourage collaborative learning and creativity, it will affect the implementation of KM. Yazdani, Yaghoubi, and Hajiabadi (2011) assert that the lack of a "corporate culture that encourages collaboration, trust, learning, and creativity can be the main obstacle to the development and deployment of successful KM" (p. 103). Hence, organizational culture can affect knowledge acquisition, sharing, and use in an organization and also lead to an adequate or inadequate KM implementation.

Empirical literature supports the link between culture and KM processes. In a study assessing the relationships between five cultures and KM processes, Chang and Lin (2015) found that culture was significantly related to KM processes. For instance, a result-oriented culture positively affected how knowledge was created, stored, used, and transferred by individuals. De Long and Fahey (2000) argue that culture influences the comportments essential to KM processes by shaping assumptions about knowledge, identifying the link between people and firm knowledge, creating a framework for social collaboration, and modeling the practices of the creation and scattering of organizational knowledge. Witherspoon, Bergner, Cockrell, and Stone (2013) focused on factors influencing the sharing of organizational knowledge. They found that culture has a positive effect on the intention to share knowledge. Moon and Lee (2014) also found that organizational culture significantly affected KM effectiveness in Korean organizations. Hence, the following hypotheses are suggested:

1. Hypothesis 5. Organizational culture has a direct effect on KM processes.
2. Hypothesis 6. Organizational culture has a direct effect on KM effectiveness.

Knowledge Management Processes and Knowledge Management Effectiveness

Several studies have used both conceptualization and empirical studies to link KM processes and KM effectiveness. Aujirapongpan et al. (2010) and Rusly et al. (2012) conceptualize that KM processes and capabilities affect knowledge management effectiveness. Gold et al. (2001) and Zelenkov (2018) emphasize that KM influences organizational effectiveness. Masa'deh, Shannak, Maqableh, and Tarhini (2017) investigated empirically the relationship between KM processes and

KM performance in a Jordan University. They used creativity, knowledge satisfaction, and knowledge quality to measure KM performance. They found that KM processes had a positive and significant impact on KM performance, while KM performance had a positive influence on job performance. Singh, Mittal, Sengupta, and Pradhan (2019) evaluated the influence of knowledge sharing and knowledge helping on prosocial knowledge effectiveness (team learning and team leadership). They found that knowledge sharing and knowledge helping were significant determinants of prosocial knowledge effectiveness.. Hence, the following hypothesis is suggested:

Hypothesis 7. KM processes have a direct effect on KM effectiveness.

Based on the aforementioned review of the literature, the following questions were explored in this study:

1. What are the perceptions of the healthcare practitioners about their psychological and structural readiness for KM, organizational ethical climate, organizational culture, KM processes, and KM effectiveness?
2. Do change readiness (psychological and structural readiness), organizational ethical climate, organizational culture predict KM processes?
3. Do change readiness (psychological and structural readiness), organizational ethical climate, organizational culture, and KM processes predict KM effectiveness?

Methodology

Sample

The study used a cross-sectional survey that focused on the healthcare industry. Respondents comprised healthcare personnel working in hospitals and private clinics in Butembo and Musienene, in the Democratic Republic of Congo. They were qualified to participate in the study since KM is critical in the healthcare industry for high quality and effective healthcare (Almuayqil, Atkins, & Sharp, 2015). The study used purposive sampling. Questionnaires were distributed to 220 participants from six hospitals and private clinics. Only willing healthcare employees and hospitals participated in the research.

Research Instrument

Scales used in the research instrument were adapted from previous studies. All constructs used the five Likert scale. The responses ranged from one to five, with one corresponding to *strongly disagree*, while five to *strongly agree*. Before its distribution in hospitals, the instrument was translated into French.

Most items for the research instrument were adapted from previous studies. Change readiness items were adapted from Holt, Bartczak, Clark, and Trent (2007), Ho et al. (2014), Peachey (2006), and Ghosh and Scott (2006). Psychological readiness dimensions that included change appropriateness, management support, personally beneficial, change efficacy, communication climate, innovativeness, and learning came from Holt et al. (2007) work. Collective commitment and collective efficacy were developed based on the literature review. Learning dimension items came from Ho et al. (2014) work and structure dimension derived from Peachey (2006) and Ghosh and Scott (2006). The organizational ethical climate instrument was adapted from Tseng and Fan (2011) and Peachey (2006). Organizational culture items were adapted from the works of Peachey (2006) and Zheng (2005). KM processes' instrument was adapted from Muhammed (2006) and Tseng and Fan's (2011) research. Finally, the KM effectiveness instrument was adopted from Peachey (2006). It measured how individuals were satisfied with KM implementation in the organization.

The internal consistency of the measurement instrument was judged with Cronbach's Alpha. Most constructs had an appropriate Cronbach value (> .70) except for organizational culture (0.625) and organizational ethical climate (0.448). The structural dimension of change readiness constituted by items about communication, learning, and structure has a Cronbach coefficient of 0.743. Items in the structural dimension that measured innovativeness were removed from the model because they did not load appropriately when testing for reliability. Psychological readiness has a Cronbach alpha coefficient of 0.809. The organizational ethical climate had the lowest Cronbach value, which was outside the acceptable range for exploratory studies (Hair et al., 2014). It was not included in the multiple regression procedure. Hence, hypotheses 3 and 4 were not tested in this study. The organizational culture had a Cronbach coefficient of 0.625. KM processes, which were measured by 16 items, had a Cronbach value of 0.796. KM effectiveness has a Cronbach coefficient of 0.761.

Data Collection and Analysis

Before data collection, letters requesting permission to distribute the questionnaires were sent to regional governmental healthcare representatives and hospital managers. Three hospitals and three private clinics accepted the survey. To increase the response rate, the management of hospitals suggested the early morning session as the best time for questionnaire distribution since many physicians and nurses attended these sessions.

Data were analyzed using IBM SPSS 25. The mean and standard deviation served to describe the sample. Pearson correlation coefficients tested the strength of the relationship among the variables. Multiple regression assisted in finding the significant predictors of KM processes and KM effectiveness. Before conducting

multiple regression, the assumptions of multicollinearity, normality, and homoscedasticity were checked.

Results

A total of 220 questionnaires were distributed. More than half of the questionnaires (130) were returned, representing a response rate of 53%. However, only 117 questionnaires were suitable for further analysis. Of the valid questionnaires, the majority of the respondents (73.5%) were nurses followed by medical doctors (16.2%), and other medical staff (10.3%). Women represented 62% of the respondents. More than half of the respondents (52.1%) had an undergraduate degree. Those with a high school degree represented 24.8% of the respondents. Approximately 6.8% had a master's degree and 16.2% a medical doctor degree. It is, however, important to highlight that most respondents with a high school degree were either nurses or laboratory technicians.

Change Readiness, Organizational Culture, Knowledge Management Processes, and Knowledge Management Effectiveness

Table 1 shows the mean and the standard deviation of the variables of the study. These values assessed the overall structural readiness, psychological readiness, organizational culture, KM processes, and KM effectiveness as perceived by respondents. However, this section examines the perceptions of respondents regarding change readiness, organizational culture, KM processes, and KM effectiveness in healthcare organizations.

Change readiness. Based on the overall means, respondents were more psychologically ready (M = 3.74, SD = .43) than structurally ready (M = 3.70, SD = .60) for KM. For psychological readiness, respondents agreed with most of the statements. For instance, respondents stated that KM changes give them the skills to make decision about the way their work is done (M = 4.10, SD = .89), it improves organizational efficiency (M = 4.07, SD = .93), and were supported by seniors' leaders (M = 4.03, SD = .79). However, the respondents were neutral about their abilities to create, store, share, and use knowledge (M = 3.21, SD = 1.07) and the required adjustments to work when the changes are adopted (M = 3.24, SD = 1.01).

For structural readiness, respondents were primarily in agreement with the statement that their hospital structure promotes collective behavior than personal behavior (M = 3.91, SD = .805). They also agreed that the hospital was urging employees to attend seminars and group discussions (M = 3.87, SD = .943). However, respondents were neutral on the statements that indicate that the structure of the hospital allows employees to go anywhere in the organization they can find the information they need for their work (M = 3.36, SD = 1.07).

Organizational culture. For organizational culture, the respondents agreed with the statements that people work like members of a team in the hospital (M = 3.91, SD = .69), that the hospitals encourage learning (M = 3.91, SD = .76), and that employees are urged to suggest ideas for new opportunities (M = 3.79, SD = .80). However, many employees were neutral on the statements that people are encouraged to take risks (M = 3.45, SD = .89) and people easily reach a consensus in the face of difficult issues (M = 3.42, SD = 1.05).

Knowledge management processes. Respondents agreed with all the statements about KM processes. The highest level of agreement was for the statements about knowledge use and knowledge creation. For instance, respondents agreed that they use the knowledge to work more effectively (*M* = 4.2, *SD* = .75), to enhance their professional abilities (*M* = 4.25, *SD* = .68), and to satisfy customers 'needs (*M* = 4.21, *SD* .84). Also, respondents agreed that they have created new knowledge by combining the information they have collected (*M* = 4.18, *SD* = .65), observing others working (*M* = 4.09, *SD* = .81), interacting with others (*M* = 4.03, *SD* = .81), and applying what they knew (*M* = 3.84, *SD* = .92). The lowest level of agreement was with statements about knowledge acquisition. Employees agreed that they acquire the needed knowledge by consulting internal documents and patients' files (*M* = 3.5, *SD* = 1.03), by attending conferences or training organized by the hospital (*M* = 3.73, *SD* = 1.07) or by asking their colleagues and supervisors (*M* = 3.79, *SD* = .97). Level of agreement on knowledge storage statements and knowledge sharing were found between the two extremes. Respondents agreed that they stored their knowledge in written documents (*M* = 3.87, *SD* = .95) and by incorporating the new information into their work (*M* = 3.82, *SD* = .94). Finally, respondents agreed that they have shared their best practices with other medical personnel (*M* = 4.09, *SD* = .82), at other request (*M* = 3.71, *SD* = .92), that they have recorded for themselves (*M* = 3.51, *SD* = 1).

Knowledge management effectiveness. For KM effectiveness, respondents agreed with all statements. Statements for which they showed the highest level of the agreement include "the available knowledge in my organization improves my effectiveness in performing my tasks" (*M* = 3.91, *SD* = .73) and "I am satisfied with the knowledge sharing among individuals in my organization" (*M* = 3.73, *SD* = .81). The lowest level of agreement was with the statements "I am satisfied with the availability of knowledge for my tasks" (*M* = 3.71, *SD* = .91) and "I am satisfied with the management of knowledge in my organization" (*M* = 3.68, *SD* = .87).

On average, respondents agreed that knowledge acquisition, creation, storage, sharing, and use mechanisms were implemented in different hospitals. The highest level of agreement was with knowledge creation and knowledge use, while the lowest was for knowledge acquisition. For knowledge sharing, the agreement of the respondents was among the lowest. It seems knowledge sharing was not done to a greater extent in the organization. This is in agreement with Almuayqil et al.

(2015), who asserted that doctors resist sharing their findings and initiatives. However, for the overall scale of KM processes, respondents were more in agreement compared to KM effectiveness.

Correlation Analysis

Pearson correlation was done to test the relationships between change readiness (psychological readiness and structural readiness), KM processes, organizational culture, and KM effectiveness (Table 1). KM effectiveness was positively and moderately related to KM processes (r = .496, p < .01), structural readiness (r = .400, p < .01), psychological readiness (r = .307, p < .01), and organizational culture (r = .309, p < .01). KM effectiveness had the highest correlation with KM processes followed by structural readiness and organizational culture. KM processes was moderately related to organizational culture (r = .466, p < .01), structural readiness (r = .422, p < .01), and psychological readiness (r = .372, p < .01). The highest correlation was between organizational culture and KM processes.

Results of correlation suggest that KM processes had a major impact on KM effectiveness followed by structural readiness, organizational culture, and psychological readiness. Hence, KM is perceived as more effective when KM processes are well implemented, the organization is structurally and psychologically ready for the change, and when the organizational culture reinforces the change. From the same findings, the organizational culture had the highest effect on KM processes, followed by structural readiness and psychological readiness. Hence, the results imply that the more the organization has an appropriate culture and is at the same time structurally and psychologically ready for KM, the greater the presence of appropriate KM processes.

Table 1: Means, Standard Deviations, and Significant Correlations

Variable	M	SD	1	2	3	4
1. KM effectiveness	3.75	0.63	1			
2. KM processes	3.90	0.47	.496**	1		
3. Psychological readiness	3.74	0.43	.307**	.372**	1	
4. Structural readiness	3.70	0.60	.400**	.422**	.511**	1
5. Organizational culture	3.70	0.54	.309**	.466**	.369**	.377**

* p < 0.05, ** p < 0.01

Regression Analysis

Before conducting multiple regression, the assumptions of normality, multicollinearity, and linearity were assessed. All coefficients of correlation were lesser than 0.9 (Table 1). Also, the variance inflation factors (VIF) were within the

acceptable range (VIF < 10) as suggested by Hair et al. (2014). The normal P-P plot of standardized residuals showed that there were no major deviations from the normality line suggesting that the distribution of residuals was normal. Besides, the values of skewness and kurtosis were lesser than |2|. Hence, the assumption of normality was met based on these values. The scatterplot of residuals did not show any obvious pattern. Residuals were equally distributed around zero of both the X and Y axes. The results indicated that the assumption of homoscedasticity was met. Since the distribution of residuals was normal and the postulation of homoscedasticity was met, then the assumption of linearity was met (Hair et al., 2014). Hence, it was possible to proceed with multiple regression analysis.

Predictors of KM processes. Significant predictors of KM Processes were determined using stepwise multiple linear regression analysis. Organizational culture and structural readiness explained 28.8% of the variance of KM Processes with an adjusted R^2 of 27.5% and were significant at F (2,114) = 23.039, p<0.001 (Table 2). Individually, organizational culture ($\beta = 0.357$, $p < .01$), had the highest contribution to predict KM processes than structural readiness ($\beta = 0.288$, $p < .01$). However, psychological readiness did not appear in the final model of KM processes.

Table 2
Stepwise multiple regression analysis summaries for KM processes (N=117)

Variable	B	SEB	β
Organizational culture	0.309	0.074	0.357***
Structural readiness	0.233	0.066	0.288**
Constant	1.933	0.066	

Note. R^2 =0.288; F (2,114) =23.039, p<0.001, R^2 adjusted=0.275
**p<0.01; ***P<0.001

Predictors of knowledge management effectiveness. The study hypothesized KM effectiveness as a function of KM processes, change readiness (structural and psychological readiness), organizational culture, and organizational ethical climate. The organizational ethical climate was removed from multiple regression as its Cronbach value was outside the acceptable range. Hence, stepwise multiple linear regression was conducted to determine how structural readiness, psychological readiness, organizational culture, and KM processes predicted KM effectiveness. The regression model was statistically significant at F (2,114) = 23.288, p<0.001. KM processes and structural readiness explained 29% of the variance of KM effectiveness with an adjusted R^2 of 27.8% (Table 3). The beta coefficients suggested that KM processes ($\beta = 0.398$, $p < .001$), contributed the most to predicting KM effectiveness than structural readiness ($\beta = 0.231$, $p < .01$). However, organizational culture and psychological readiness were not significant predictors of KM effectiveness.

Table 3
Stepwise multiple regression analysis for KM effectiveness (N=117)

Variable	B	SEB	β
KM Processes	0.543	0.119	0.398***
Structural readiness	0.244	0.092	0.231**
Constant	0.730	0.447	

Note. R^2 =0.29; F (2,114) =23.288, p<0.001; R^2 adjusted=0.278
**p<0.01; ***P<0.001

Discussion

This paper focused on testing if change readiness (structural and psychological readiness), organizational culture, and KM processes were significant predictors of KM effectiveness. Several findings emerged. First, structural readiness was a significant predictor of KM processes. However, psychological readiness did not affect KM processes. This was in contradiction to what Rusly et al. (2012) conceptualized where both structural readiness and psychological readiness affected knowledge acquisition, creation, and sharing. However, structural readiness significantly affected KM processes. The main dimensions that reflected structural readiness include the learning process and structure of the organization. Hence, change readiness was an important factor affecting KM processes. Therefore, hypothesis 1 was partially supported.

Second, structural readiness significantly influenced KM effectiveness. Previous studies have not tested the relationship between change readiness and KM effectiveness. Rusly et al. (2012) only hypothesized the relationship between change readiness and KM processes. However, the sous-dimensions reflected by structural readiness instrument included learning (training) and structure. In light of these dimensions, Moon and Lee (2014) found a significant relationship between learning and KM effectiveness. Knowledge sharing process partially mediated that relationship. Also, Zheng et al. (2010) found that organizational structure influenced to a certain extent KM effectiveness. However, Eden (2014) found that organizational structure did not affect both individual and organizational KM effectiveness. Although the literature presents mixed findings, structure readiness was a significant predictor in the current study. Therefore, Hypothesis 2 was partially accepted.

Third, the organizational culture had a significant positive effect on KM processes. The finding was consistent with previous studies where culture played a huge role in affecting knowledge creation, sharing, and transfer (DeTienne, Dyer, Hoopes, & Harris, 2004) and reinforcing KM processes (Allameh, Harooni, Farsani, & Farsani (2013). Chang and Lin (2015) found that different organizational cultures, such as results-oriented culture, affected KM processes. De Long and Fahey (2000) argue that organizational culture influences different behaviors and creates a context for social interaction central to, for instance, KM

processes. The presence of such context can lead to knowledge creation and knowledge sharing (Moon & Lee, 2014). Hence, the study found organizational culture as an important factor affecting KM processes implementation in hospitals. Therefore, hypothesis 5 was supported.

Fourth, organizational culture did not affect KM effectiveness. This was opposite to the findings of Zheng et al. (2010) where organizational culture was the highest influencer of KM effectiveness compared to organizational structure and organizational strategy. Eden (2014) found that organizational culture significantly affected both individual and organizational KM effectiveness. Biloslavo, Kljajić-Dervić, and Dervić (2019) found that organizational culture was a significant determinant of KM effectiveness. Although organizational culture did not affect KM effectiveness in this study, it may have had an indirect effect on KM effectiveness through KM processes. Therefore, hypotheses 6 was rejected.

Fifth, KM processes had a positive and significant effect on KM effectiveness. This is consistent with existing literature. Gold et al. (2001) found that KM process capabilities affected organizational effectiveness. Zelenkov (2018) found that KM had a significant effect on organizational effectiveness for private organizations while not significant for state-owned organizations in Russia. The effect of KM was higher compared to the effect of change readiness. Moon and Lee (2014) studied the mediating role of knowledge sharing process between organizational culture and KM effectiveness. They found that knowledge sharing process was a significant partial mediator between organizational culture and KM effectiveness. Chong and Chong (2009) contend that organizations must possess successful KM processes to have a positive KM implementation. Thus, KM processes is a very important factor for KM effectiveness. Hence, Hypothesis 7 was verified.

Theoretical and Managerial Contributions

The main theoretical contribution of this study was to test the effect of change readiness (psychological and structural readiness) on KM processes. This study showed that besides impacting KM effectiveness via KM processes, structural readiness also had a direct and significant effect on KM effectiveness. However, psychological readiness failed to impact both KM processes and KM effectiveness.

The study had several managerial contributions for hospitals and healthcare organizations. First, given the significant links between KM processes and change readiness (structural readiness) with KM effectiveness, hospitals should invest in developing KM processes and make the organization ready for any change implementation. Developing mechanisms to increase knowledge sharing, creation, use, acquisition, and storage should be paramount for different hospitals. Also, change readiness should receive adequate consideration by focusing particularly on structural readiness. This implies that hospitals should create more training, workshop, and seminars that employees can attend and contribute to so that they may increase their knowledge.

Second, organizational culture and structural readiness were significant predictors of the KM processes with organizational culture having the highest effect. This is important for hospital managers. They should continue to reinforce strategies that allow hospitals to have cultures adequate for KM processes implementation. This demands that hospitals implement a culture of learning, risk-taking, and team working to provide appropriate services to clients.

Limitations and Recommendation for Future Research

This study contributed to finding the determinants of KM effectiveness. However, the results are subjected to several limitations. First, the study used a nonprobabilistic sample. Data were collected from hospitals and respondents that were ready to participate. Second, the small sample may have affected the results. Future studies should include hospitals in the whole province. This will increase the generalizability of the findings. Third, certain important variables, such as technology capability, were not included in the study. This may explain the level of variance in KM effectiveness explained by this study. Fourth, the organizational ethical climate was not tested because of its low reliability. The concept was assessed using two items. Future studies should include several items to measure the organizational ethical climate construct. Fifth, most respondents came from urban hospitals. The results may not fully express the perceptions of respondents from rural hospitals with different challenges. Sixth, the instrument used to measure the main variables of this study may be another limiting factor. For instance, for KM effectiveness, there is no clear instrument accepted by many people (Peachey, 2006). Therefore, the findings should be considered with great caution.

However, the abovementioned limitations, coupled with the findings of the study, open avenues for further explorations. First, a comparative study that evaluates whether the predictors of KM effectiveness in the rural areas are similar to those in the urban areas is crucial. These two settings face different challenges, such as accessibility to external sources of information. Second, technology was not included in this study as an independent variable. However, several authors have indicated that technological infrastructure is a critical component in KM (Peachey, 2006). Future studies may consider the concept, particularly the use of mobile phones by nurses and medical doctors, and their effect on KM processes and KM effectiveness. In fact, in under-developed countries where electricity is rare and the only tool for communication is a mobile phone, many healthcare practitioners are part of social media groups such as WhatsApp and messenger groups, where they share information about challenging cases. Evaluating the effect of such technology in sharing information and learning new skills is worthy of study in developing countries. Third, the study focused on the factors that affect KM processes as a group. However, it is also important to assess the factors that affect knowledge sharing, creation, and use. Studies that focused on each process

will bring more light on the individual factors that affect each process. Fourth, psychological readiness was not a significant predictor of KM processes and KM effectiveness. Future research may look at its effects in other contexts. Zheng et al. (2010) argue that procedures and uses of KM are context-specific. Finally, a qualitative study that explores how nurses and medical doctors create, share, store, and apply knowledge will generate more insights into the practices of KM in an under-developed country.

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