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Article

The impact of knowledge management practice on the hospital performance in Abu Dhabi

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MANAGEMENT | RESEARCH ARTICLE

The impact of knowledge management practice on the hospital performance in Abu Dhabi

Main Naser Alolayyan^{1*}, Abdallah Hassan Alalawin², Mohammad S. Alyahya¹ and Ahmad Qamar²

Abstract: This study proposes a conceptual model that simultaneously involves five factors of Knowledge Management (KM) and six factors of Hospital Performance (HP), in their respective constructs. The significance of this model is that it has logically linked the constructs of both KM and HP. Exploratory factor analysis, reliability analysis procedure, and construct validity procedures have been used to verify and validate the underlying dimensions of KM and HP. The relationship has been analyzed through Structural Equation Modeling approaches, in the last stage of the data analysis, the results found that only three variables of KM construct have a significant directional impact on the only three variables of HP construct effects. Further, the in-depth data analysis has revealed that the three variables of KM construct have a statistically significant influence on the three variables of HP construct. The statistically rigorous and strong results obtained in this study suggest that this conceptual model can be used as a management tool to assess

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PUBLIC INTEREST STATEMENT

The Majority of the new trends in the organization management systems consider knowledge as one of the main assets they have. How to utilize this knowledge to improve the organization's performance is a researchable area, where organizations invest more and more to focus on it. The focus of this paper is to investigate the linkage between Knowledge Management and Hospital Performance. This research provides empirical evidence for the direct impacts of Knowledge Management on the Hospital Performance. The suggested model can be used as a management tool to assess hospital performance, which can be used to improve hospital performance and efficiency.

performance. The significant impact of KM on HP has been argued to be positive. The value of the paper is that it clarifies the influence of KM on HP in Abu-Dhabi hospitals which can be used to improve hospital performance and efficiency.

Subjects: Healthcare Administration and Management; Quality of Life; Health Communication; Health Informatics and Statistics

Keywords: Knowledge Management (KM); hospital; performance; Abu-Dhabi; structure equation modeling

1. Introduction

The practice of knowledge management (KM) has gained much importance in the last few decades. Knowledge management (KM) has become a primary tool for organizations that seek to operate at an optimal level and meet the maximum satisfaction of all customers. Knowledge management (KM) is largely considered as a natural process that prevails in all present-day modern organizations. Further, it is an integrated system that significantly combines human resources, processes, and state of art within an organization for achieving long-term and sustainable goals through improving organizational performance based on learning. It is believed that knowledge management simultaneously works as a vital resource for the organization and allows organizations to better compete in the market (Tan & Nasuridin, 2011). Improving the knowledge management of the financial sector has become a main issue for customers, hospital owners, governments, and managers. Today, knowledge management has come to have a direct effect on organizational performance. An ample body of previous literature on the current area of interest has revealed that KM plays a vital role in significantly improving organizational performance, along with providing a clear answer to the question: "How can the organization enhance its organizational capabilities, resulting in the enhancement of internal performance and external competitiveness?"

2. Literature review and theoretical framework

The evaluation of KM performance in organizations has been a main point of focus in the previous literature. On one hand, studies such as L.-C. Wu et al. (2008) have approached this issue with the concept of using account and finance techniques to measure intellectual capital and/or knowledge assets, and have adopted the real options methodology to produce a financial method for evaluating knowledge-based organizations. On the other hand, other studies in the literature have explicitly focused on the relationship between KM and organizational performance using overall business measures such as profitability, productivity, and market performance (Anantatmula & Kanungo, 2006; Gold et al., 2001; Iqbal et al., 2019; Kiessling et al., 2009; Payal et al., 2019). For example, Gold et al. (2001) carried out a survey-based study in which they tested a model for the relationship between KM and organizational capabilities, including infrastructure and processes capabilities and organizational effectiveness, Iqbal et al. (2019) tested the direct relation between KM processes and Hospital performance (HP), their finding is that processes influence directly and indirectly through innovation and intellectual capital, Payal et al. (2019) investigated the dynamic relationships KM constructs and their links to HP using a holistic integrated model, a significant positive relationship is found. However, it is worth mentioning that many of these studies have tended to overlook the complexity of the relationship between KM and business performance and have not provided practitioners with sufficient necessary output to help them develop and monitor Knowledge Management Assessments (KMAs).

Therefore, for more in-depth analysis of the phenomenon, other studies have instead focused on the relationship between KM and innovation, the latter being considered a direct outcome of the former. Researchers of such studies believe that knowledge and innovation are interrelated (Murovec & Prodan, 2009) and view knowledge as a primary factor of innovation (Abbas & Sağsan, 2019; Brand, 1998; Elmorshidy, 2018; Hassan & Raziq, 2019; Kumar, 2016; Susanty et al., 2019). For example, Susanty et al. (2019) found that innovation performance will decrease by

compensating knowledge improvement. On the other side Hassan and Raziq (2019) found a positive association between KM and radical innovation.

KM can thus be considered an organizational mechanism for the continual promotion and development of innovation (Chang & Chen, 2004). In support of the relationship between knowledge and innovation, numerous well-organized empirical studies have revealed that knowledge management-driven organizations tend to exhibit higher levels of innovation (Arias (Aranda & Molina-Fernández, 2002; Darroch, 2003, 2005; Hassan & Raziq, 2019; Iqbal et al., 2019; Singh et al., 2019). Some case-based studies have explored this link in innovation-driven business processes such as research development and new product development in knowledge-intensive businesses such as telecommunication (Akeke & Olayiwola, 2019; Gyemang & Emeagwali, 2020; Massey et al., 2002) and IT (Kodama, 2006).

On the other side of the spectrum, other researchers hold the view that the nexus between innovation and performance management is rather simple and direct than complex. In their work, Jiménez-Jimenez et al. (2008) explicitly state that for many organizations, being innovative is not enough for success. In their 2005 study, Vijande et al. (2005) shed light on the relationship between innovation, market orientation (MO), and performance and argued that performance needs an organizational ability to anticipate, respond, and significant focus on environmental issues as such is conceptually bound to local environmental strategy, and Udriyah et al. (2019) argue the relationship between market orientation (MO) and innovation with business performance which they have a significant direct and indirect through competitive advantage.

Though it is agreed that the relationship between KM and performance is intertwined with the use of innovation and MO as mediating variables between organizational learning and performance (Hurley & Hult, 1998; Jiménez-Jimenez et al., 2008; Udriyah et al., 2019). MO was not included in this research model. This is because MO places intensive focus on customer needs whilst greatly overlooking other significant environmental changes brought about by factors such as new technologies, legal circumstances, social development, mergers, consolidations, etc. (Nzewi & Moneme, 2016; Overby et al., 2005).

An agility literature review revealed that many researchers view that KM has become a fundamental factor of business prosperity. Modern organizations are forced to deal with an increasingly unstable environment brought by globalization, advances in IT, and rise in living standards, increased regulations and corporate governance demands, less cohesion in social values, and the rise of post-modernism (Cai et al., 2019; Nzewi & Moneme, 2016; Overby et al., 2005; Sambamurthy et al., 2003; Worley & Lawler, 2010). Cai et al. (2019) investigated how to leverage KM and IT capability to build agility in the context of innovation.

Agility is a term used to refer to a firm's level of awareness of competitive opportunities and threats and its ability to use this awareness in taking innovative, competitive decisions such as introducing new products, making new process improvements, and forming new alliances (Saha, 2017; Sambamurthy et al., 2003). This awareness and the response to this awareness are two fundamental factors that demonstrate the inter-relatedness of agility and innovation (Cai et al., 2019). Dove (1999) defined "response-ability" as the physical ability to act through innovations and "sensing ability" as the KM abilities required to find appropriate factors to act on. Matthews and Harris (2006) argued that agile organizations are usually knowledge driven. Such organizations thrive on the ability to react rapidly to environmental changes by gathering necessary knowledge and assets and then making innovative changes (Raschke, 2010). Practitioners in the fields of KM, IT, and strategy (Tallon et al., 2019; Van Oosterhout et al., 2006) and academics (Dove, 1999; Overby et al., 2005; Saha, 2017) have come to view agility as the strategic perspective that truly captures the significance of KM. Thus, in our current study, we have taken agility to be the level at which the organization finally links KM to performance.

Finally, very few studies focus on the relation between KM and hospital performance. Najmi et al. (2018) found that KM has no significant effect on hospital performance, and this result was against the most comment result which indicates that there is a significant relation between KM and HP like Liu et al. (2005), Zheng et al. (2010), and Udriyah et al. (2019), another study by Tang (2017) and I.-L. Wu and Hu (2012) found that KM has a significant effect on hospital performance, and many other studies support the same result in healthcare sector. (Achmad & Grace, 2019; J.-L. Chen, 2017; Karamat et al., 2019)

3. Methodology

In this section, the methodology of the current study is discussed in detail. Procedures and processes involved in developing and choosing the instrument used for data collection are outlined. Finally, the validity test and reliability test estimates of the instrument, the procedure for data collection, and the complete data analysis process are explained.

3.1. Research setting

The research setting refers to the place that can be seen as the physical, social, and cultural site where the data are collected. This study was conducted in five hospitals (privet and government) in Abu Dhabi emirate, the staff which participated in the study from many various departments in the hospitals, the study objective to determine the relationship between Knowledge management practice and hospital performance.

3.2. Research design

A research design is exploratory research that researchers use to conduct a scientific study. It is the overall synchronization of identified components and data resulting in a plausible outcome.

A research design is defined as the general main plan of how a researcher will go about answering the research questions that she or he has set (Saunders et al., 2016). Consequently, the research design has two main functions: the first is to emphasize the importance of quality in these procedures to ensure their validity, objectivity and accuracy, and the second is the identification and development of procedures and logistical arrangements required to undertake a study (Kumar, 2005).

In our research, quantitative research was used by implementing experimental design research; for this research to allow for testing of the relationship and establishing cause and effects on the research question (Saunders et al., 2016). The study utilized this design to identify and describe the effects of knowledge management practice on hospital performance in Abu Dhabi emirate hospitals.

3.3. Study population

The population is described as all members of the study community, as well as any well-defined category of people, events or things that are allotted and generalized about it, on the other hand, a sample is defined as a part of the population or a small group that is observed and identified in a research study (Manoharan, 2010). The target population in statistics is the specific population about which information is desired. Population studies also called census are more representative because everyone has an equal chance to be included in the final sample that is drawn according to Mugenda (2003), the target population for this study consisted of hospitals medical staff and staff from many various departments.

3.4. Sample and sampling techniques

Sampling is defined as a delicate process of selecting specific members or a subset of the total population to make inferences and statistical studies from them and to estimate general characteristics of the entire community. Researchers use all sampling types on a social science and market research, so that they do not need to study all members of the population to reach general judgments. It is also a method that has the qualities of being both time and cost-effective and thus forms an important basis for any research design.

Gy (1992) argues that the comprehensiveness of a study sample is fundamental for its reliability, as it allows for the generalization of the study findings. Though sample sizes may differ depending on the type of research in question, the ideal sample size, five observations for each independent variable 5:1 is usually the ratio used to determine statistical power (sample size) (Hair, 2009). In accordance with the above condition, the researcher selected a moderate yet appropriate sample size of 200 respondents from the five hospitals; however, only 200 responses were returned back for analysis. Participants were chosen from a list of the targeted population of the study using a stratified random sampling technique (stratified random sampling is a method where the population can be divided into smaller groups, that don't overlap but represent the entire population together. While sampling, these groups can be organized and then draw a sample from each group separately).

The sampling techniques focused mainly on certain demographic characteristics of the research population, namely Gender [Male—122 (61%), Female—78 (39%)]; Age [20–35 yrs—170 (85%), 36–50 yrs—27 (13.5 %), 51–65 yrs—3 (1.5%)]; Level of Education [Diploma—11 (5.5%), Graduate—85 (42.5%), Postgraduate—104 (52)]; Profession [Manager—2 (1 %), Senior Officer—26 (13 %), Head of Department—33 (16.5 %), Supervisor—25 (12.5 %), administrators—83 (41.5 %), Health Management Staff—31 (15.5%)]; and Years of Experience [2 yrs or less than 2 yrs—56 (28%), 3–5 yrs—66 (33 %), 6–10 yrs—63 (31.5 %), and 11–25 yrs—15 (7.5 %)]. Table 1 presents details on the research sample selected for this study.

The study sample consisted of 200 respondents, 27 (13.5 %) from Al Corniche Hospital, 85 (42.5%) from Sheikh Khalifa Medical City, 33 (16.5 %) from Lifeline Hospital, 30 from (15 %) Al Salam Hospital, and the remaining 25 (12.5%) from Mafaraq Hospital. Table 2 presents a summary of the study sample size.

The volunteers involved in the research were staff from the five hospitals which was selected. The five hospitals were strictly which conformed to the key criteria used for sample selection in this study.

Table 1. Sample statistics of the respondents

		Frequency (N)	Percentage %
Gender	Male	122	61
	Female	78	39
Age (years)	20–35	170	85
	36–50	27	13.5
	51–65	3	1.5
Education level	Diploma	11	5.5
	Graduate	85	42.5
	Postgraduate	104	52
Profession	Managers	2	1
	Senior Officers	26	13
	Head of Departments	33	16.5
	Supervisors	25	12.5
	Administrator	83	41.5
	Health Management Staff	31	15.5
Experiences	2 years or Less than 2 years	56	28
	3–5 years	66	33
	6–10 years	63	31.5
	11–25 years	15	7.5
Total		200	100%

Table 2. Hospitals names and sample size for each hospital

Hospital name	Sample number	Percentage %
Al Corniche Hospital	27	13.5
Sheikh Khalifa Medical City	85	42.5
Lifeline Hospital	33	16.5
Al Salam Hospital	30	15
Mafraq Hospital	25	12.5
Total	200	100%

3.5. Study variables

It was initially envisaged that the only dependent variable in the study was hospital performance and the independent variable was knowledge management practice. Literature, as well as findings, confirmed that all variables i.e. knowledge management practices and health information management are positive influence on the organization performance as general, and hospital performance as special case. Independent variables were confirmed to relate well with dependent variables to produce meaningful results.

The survey tool is a tool for the continuous implementation of a rigorous scientific protocol to obtain data from respondents in an efficient manner; the tool includes a questionnaire that provides clear and understandable text to present a standard set of questions related to the study problem as well as answer options. The survey tool contains questions that address specific study objectives. The Survey Tool can also be used to collect demographic data. Our questionnaire was developed based on the objective set to clarify the relationship between knowledge management and hospital performance in Abu Dhabi emirate hospitals.

A three-part questionnaire was used for the collection of data in this study. Part A consisted of questions on the demographic characteristics of the respondents, part B on knowledge management practices (KM constructs), and part C on organizational performance (Hospital) (HP constructs). The items in the three parts were based on previous authentic research related to the current area of interest. The following paragraphs present details on the numbers and sources of these items. “Part A” focused on certain demographic characteristics of the respondents, namely Gender (Male or Female), Age (20–35 yrs; 36–50 yrs; and 51–65 yrs), Level of Education (Diploma; Bachelor Degree; and Postgraduate), Profession (Manager; Senior Officer; Head of Department; Supervisor; Administrator; and Health Management Staff), and Years of Experience (2 yrs or less than 2 yrs; 3–5 yrs; 6–10 yrs; 11–25 yrs; and 26 yrs and over). “Part B” included 43 items [adapted, modified, and used] to measure KM practices. Items in part B were based on the studies of García-Fernández (2015); Chen and Huang (2009), Kao et al. (2011), and Fugate et al. (2009). A 7-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7), was used for measurement of the data. A high number of “Strongly Agree” scores indicated a strong belief amongst many respondents in the existence of KM practices, whilst a high number of “Strongly Disagree” scores indicated the opposite. Table 3 shows in detail the composition of this construct. “Part C” consisted of 23 structured items adapted for the third part of the questionnaire (Hospital Performance) and taken from the studies of Chen and Liang (2011), Chen and Huang (2009), Alolayyan et al. (2013), and Liao and Wu (2009). This section aimed to measure the participants’ opinions on the overall performance and customer service of their hospitals. Similar to part B, answers to the questions in this section were measured on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7). A high score of “Strongly Agree” responses indicated positive participant views on hospital performance (specifically with regard to customer service), whilst a high score of “Strongly Disagree” responses indicated the opposite. Table 4 shows in detail the make-up of part C.

Table 3. List of items for KM construct

	(KM1: Knowledge Acquisition)
NA1:	Knowledge is obtained from a customer during work-related interaction.
NA2:	Knowledge is obtained from partners during work-related interaction.
NA3:	Knowledge is obtained from an employee during work-related interaction.
	KM2: (Knowledge Storage)
NS1:	Employees tend to monopolize knowledge as a source of power and are reluctant to share it with other employees.
NS2:	Staff turnover does not imply a loss of important knowledge or skills for the hospital.
NS3:	The firm has procedures for the collection of proposals from employees, which are then incorporated as knowledge by the firm.
NS4:	The firm has databases storing experiences and knowledge for later use.
	KM3: (Knowledge Creation)
KC1:	After our hospital has set its innovative goals, these goals become fixed.
KC2:	Setting the hospital's innovative plans is considered important and must meet many people's views.
KC3:	When setting our hospital's plans, the manager does not limit the ways of discussion.
KC4:	After setting an innovative plan, there can be flexible adjustments during its execution.
KC5:	After executing our company's plans, we do not care about deriving other results.
	KM4: (Knowledge Sharing)
KSH1:	During work, knowledge is shared between supervisors and subordinates.
KSH2:	During work, knowledge is shared among colleagues.
KSH3:	During work, knowledge is shared between units.
	Knowledge Implementation and Generation
KIG1	Is visiting customers' sites to better understand their needs encouraged?
KIG2	Is getting to involve in sales activities encouraged?
KIG3	Is getting to involve in helping to resolve customer problems encouraged?
KIG1	Is visiting customers' sites to better understand their needs encouraged?

3.6. Method of Data Collection

Data collection is a process of collecting information from all the relevant sources to find answers to the research problem or achieve research objective, test the hypothesis and evaluate the outcomes. Data collection methods can be divided into two categories: secondary methods of data collection and primary methods of data collection.

In this study used primary data, primary data were obtained through a structured questionnaire. The questionnaire, hard copies were utilized as the data collection tool. The hard copies were printed; a questionnaire is a written list of questions, the answers to which are recorded by the respondents (Kumar, 2019), this data collection method was utilized because it was accurate, convenient to use, inexpensive and provided anonymity for the respondents.

A well-designed and pre-tested questionnaire was used to gather data from participants on the specified variables. One advantage of questionnaires is that they can be used to gather data from a large number of people whilst requiring little time, effort, and cost. Further, questionnaires are flexible in that respondents have the freedom to fill them in their own time and to remain anonymous, which encourages honest answers. However, one disadvantage of using written questionnaires for data collection is that the researcher may be required to take further steps to ensure a satisfactory turn-in rate of questionnaires by participants. In the case of our current study, the

Table 4. List of items in the hospital performance construct

	Customer Satisfaction
CS1:	Your hospital is stronger than its competitors in terms of customer retention rate.
CS2:	Your hospital is stronger than its competitors in terms of customer satisfaction rate.
CS3:	Your hospital is stronger than its competitors in terms of representation and goodwill.
	Technical Innovation
TI1:	Your hospital is developing new technology
TI2:	Your hospital is incorporating technologies into a new product
TI3:	Your hospital is facilitating new processes to improve quality and cost
	Staff and Work System Results
SW1:	An increase in the hour's employees spent in education and training.
SW2:	An increase in the level of productivity per employee per month.
SW3:	An increase in employee satisfaction. SW4:
SW5:	An increase in information sharing.
	Productivity
PR1:	The numbers of customers has increased in the last three years.
PR2:	The number of general financial operations has increased in the last three years.
PR3:	The general productivity has improved in the last three years.
PR4:	The hospital's reputation has improved in the last three years.
PR5:	The number of service defects, errors, or breakdowns has decreased in the last three years.
	Financial Performance
FP1:	Profitability has increased in the last three years.
FP2:	The return on investment has increased in the last three years.
FP3:	The cash flow from operations has increased in the last three years.
FP4:	Cost control has increased in the last three years.
	Work relationships and participation
WR1:	Employees here are allowed to make operational decisions.
WR2:	Employees here are allowed to suggest improvements into work.
WR3:	Employees' voices here are valued by the organization

researchers made sure to encourage respondents to give accurate answers and to assure them of the confidentiality of their answers.

4. Data analysis

4.1. The pilot study

Prior to carrying out an in-depth analysis and after generating the instrument items and obtaining endorsement from the supervisor, a pilot study with a sample size of 30 participants was carried out. Respondents in the pilot study were excluded from the final sample. The researcher conducted the pilot study with the following objectives in mind:

- To ensure that the guidelines in all parts of the questionnaire were easy for respondents to understand.
- To ensure that the structure of the questions was accurate and clear.
- To ensure that all the questionnaire sections had clear response divisions.
- To measure the average time for completion for the full set of questions.
- To collect feedback and opinions on the questionnaire from the participants.

The pilot study revealed an average time for completion of 15–20 minutes. A SPSS, specifically Cronbach's Alpha Statistic, was used to properly code the data yielded from the questionnaires and to calculate a reliability score for each of the constructs. Following is a detailed summary of the reliability coefficients (r) for each of the sections: Knowledge Management (KM), $r = 0.902$; and Organizational Performance (HP), $r = 0.905$.

The feedback from the SPSS results was closely observed and considered. Further steps were taken to ensure that instructions and items were as clear and brief as possible.

4.2. Establishing the validity and reliability of the instrument

In the research, the validity and reliability scores of an instrument's items are fundamental in measuring the efficacy and functionality of the instrument. Consequently, in well-organized and careful studies validity and reliability are given much attention during the evaluation process of an instrument. Technically, validity means that all the individual scores from an instrument are understandable, meaningful, and effective in allowing the researcher to come to useful, comprehensive conclusions. According to Creswell and Creswell (2017), reliability refers to the coherence of the scores, which is also fundamental for validity. Both validity and reliability are interrelated; scores that are not coherent cannot be meaningful, and vice versa.

In compliance with the principles, the researcher implemented several procedures to measure the reliability and validity estimates of the structure of this study instrument. The implemented procedures consisted of:

- (1) A data screening exercise
- (2) Exploratory factor analysis to measure the dimensionality of each construct
- (3) A reliability test for the subscales of each of the constructs
- (4) A confirmatory factor analysis (CFA), which acts to provide adequate supports for construct validity of the instrument.

The results of the mentioned procedures are explained in the following subsections.

4.3. The data screening exercise

The Statistical Package for the Social Sciences (SPSS) was utilized for the inspection of any errors in the data before proceeding for proper and complete analysis. Inspection of this type has vital importance and relevance to researchers conducting quantitative research. Pallant and Manual (2007) stated that data screening and error cleaning is of vital importance to researchers in that it prevents any unnecessary complications from occurring during data analysis. In our current study, no significant errors (in the form of outliers and misrepresentation of figures) were discovered in the data screening process.

4.4. The Exploratory Factor Analysis (EFA)

After carefully and properly entering the data, in order to identify the underlying factors/dimensions, the items in each section were subject to a precise EFA analysis using the principal components analysis with Promax rotation. Due to its several useful characteristics, Kaiser's law (eigenvalues <1) was applied for PCA. Pallant and Manual (2007) argued that this procedure has factor loading and scree plot which are clearer and easier to understand and help the user to better decide which factors to retain. The EFA outcomes revealed the one-dimensional property of the constructs. The initial construct (Knowledge Management – KM) included three principal factors, namely Knowledge Storage (KS) (four items), Knowledge Creation (KC) (five items), and Knowledge Implementation and Generation (KI) (four items). The second construct (Organizational performance (Hospital Performance)—HP) was comprised of four components: Customer Satisfaction (CS) (three items), Productivity (one item), Financial Performance (FP) (three items) and Work Relationships and Participation (WR) (three items). The remaining items (six from KM practice and twelve from HP) were discarded from the analysis either due to cross-loading

problems or due to their loading's not being processed by SPSS because they were below the 0.6 minimal value for retention.

For the poor of performance for some of the items, the items listed in the KM construct were properly converted into three components. In order to test the sampling adequacy, the KMO statistics were used. The test statistic was 0.948 (exceeding the minimum threshold (0.5–0.6) approved by scientists of multivariate statistical analysis (Hair, 2009; Tabachnick et al., 2007). Also, Bartlett's Test of Sphericity was significant (0.000) at an alpha level of 0.001, revealing that the scores were equally spread. The Anti-image (which exceeded the approved value of 0.5) also proved the suitability of the factor analysis for the individual variables included in the analysis (Stevens, 2012; Tabachnick et al., 2007). Each one of the factors met the minimum requirements for the appropriateness of factor analysis. The total variance explained by the four factors constituting the construct showed to be high (74.913%). The 10 items produced for the HP (Hospital performance) construct are represented by the aforementioned four factors. The initial assumptions of the appropriateness of factor analysis were also met. The KMO measure for the Sampling Adequacy test turned out to be 0.890, greatly exceeding the minimum threshold value (0.6) recommended by scientists of statistical analysis (Hair, 2009; Tabachnick et al., 2007). Also, Bartlett's Test of Sphericity was significant (0.000) at an alpha level of 0.001, indicating that the respondents' scores were equally spread. The Anti-image value (all exceeding the 0.5 recommended value) further supported the appropriateness of factor analysis for each of the individual variables incorporated in the analysis (Stevens, 2012; Tabachnick et al., 2007). The total variance explained by the three factors constituting the construct showed to be high (71.046%).

To sum up, the exploratory factor analysis exercises resulted in a total of seven factors/dimensions for the two constructs and a decrease in the overall number of items from 42 to 23.

4.5. Reliability analysis procedure

The EFA was then proceeded by the Cronbach Alpha test for reliability, which was conducted using SPSS analytical software version 16.0. All of the seven dimensions were properly tested to measure the internal consistency of the subscales. During this procedure, many items had to be discarded due to low correlation with other subscale items (below 0.30), indicating that the scale contributed to less than 30% of the overall internal consistency (Pallant & Manual, 2007). Further, a value of 0.7 was determined as the minimum alpha coefficient needed to achieve a scale reliability pass mark (DeVellis, 2016; Kline, 2015; Pallant & Manual, 2007; Stevens, 2012; Tabachnick et al., 2007). According to Pallant and Manual (2007), an alpha value that is at least 0.7 indicates good internal consistency. In accordance with the above conditions, no items were dropped from the three factors of the KM construct, whilst five items were removed from the organizational performance (hospital performance) construct (four from productivity factor—PRO1, PRO2, PRO4 and PRO5—and one from Financial Performance—FP3). All of the retained items provided sufficient and acceptable Cronbach alpha for their respective factors. The alpha estimates ranged between 0.859 and 0.952. Table 5 presents information on reliability analysis.

The above table shows that the seven factors which constituted the two constructs of the current study had a very satisfactory level of internal consistency reliability, therefore indicating that the necessary criteria for “a good reliability coefficient for a social science measurement tool” were met.

4.6. Construct validity procedures

A second round of the validation process was performed in order to double-check reliability. In the second round of validation, Confirmatory Factor Analysis (CFA) for the construct validation was carried out. CFA has been considered by respected scientists of statistical analysis (Byrne, 2016; Kline, 2015) as a fundamental process and a vital preliminary measure before testing fully for the analysis of latent variables. The researcher conducted a second round to further verify the statistical adequacy and functionality of the factors and the corresponding indicators which

Table 5. Reliability output for the KM and HP (Hospital Performance) Constructs

Construct	Factors	List of Items No.	Alpha	Mean	S/D	Valid Cases
KM	Knowledge storage	NS1, 2, 3, 4.	0.902	4.453	1.5885	200
	Knowledge creation	NC1, 2, 3, 4, 5.	0.935	4.284	1.2915	200
	Knowledge implementation and generation	NI1, 2, 3, 4.	0.952	4.458	1.4662	200
OP	Customer satisfaction	CS1, 2, 3.	0.919	4.7052	1.3409	200
	Productivity	PRO1	One item	One item	One item	200
	Financial performance	FP1, 2, 4.	0.859	4.493	1.3526	200
	Work relationships and participation	WR1, 2, 3	0.887	4.145	1.4266	200

form both of the instrument's constructs. For this purpose, a set of second-order CFA analyses were carried out for each of the two constructs, KM and HP (Hospital performance).

This second round of analyses was necessary since the first round of analyses failed to yield models with satisfactory fit statistics for the sample data, and a re-specification of the model emerged as a result. This resulted in the elimination of certain items which had poor loading on their factors and had therefore likely played a role in the models being poorly fitted together. In precise terms, one item was eliminated from the organizational performance (hospital performance) construct.

Following the elimination of the item with poor loading from the organizational performance productivity construct, the modified models were rerun, and the results indicated adequate fit indices for the measurement models evaluated. The level of the fit indices was statistically significant, and parameter loading had become of practical significance. This came as a result of the parameter loading all ranging between 0.7 and 0.9, with no estimates outside the range (all the indicators loaded or converged properly on their corresponding latent variables). According to Byrne (2016), with regards to the goodness of fit index (CFI) and the Tucker Lewis Index (TLI), a value of 0.9 and over shows that a model has appropriately described the sample data. Similarly, Kline (2015) proposed that the standardized factor loading of 0.60 and over signifies the convergent validity of a construct. The Root Mean Standardized Error of Approximation (RMSEA) has been claimed to be sensible given that the obtained value is between .05 and .08 (NE & Cudeck, 1993). The Normed Chi-square value ranging from 2 and 5 was described (Bollen, 2014) as an indicator of the reasonability of a model's fit. The information yielded from this analysis revealed that the two constructs, KM (Knowledge Management) and HP (Hospital Performance), were 3-factor for knowledge management and 3-factor for the organizational performance models, respectively, as initially indicated by the EFA (Exploratory Factor Analysis) results.

5. Results and discussion

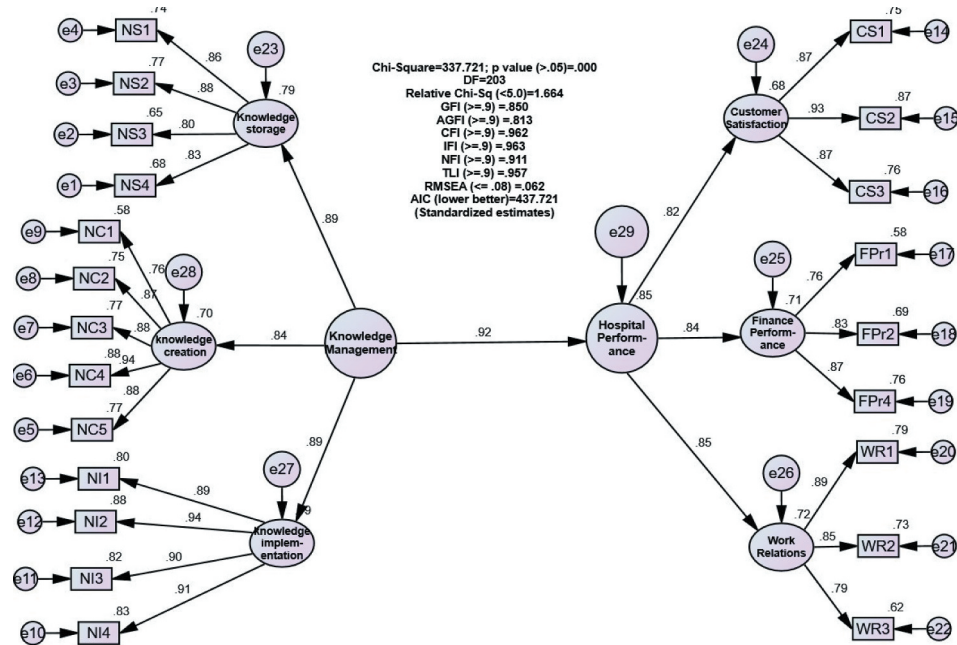
5.1. Analysis of direct impact among the constructs of the instrument (Research contribution)

This section provides detailed information about the analysis carried out for the current research and attentively the contribution that the current work was done to the existing stock of knowledge to the current area of interest. Following the logic of the quantitative research advocates that structural equation modeling (SME) provides an opportunity for the researcher to do the in-depth analysis of the effect of one construct on another Byrne (2016) and Kline (2015) a full-fledged SME has been performed. The output of the SME analysis explicitly indicates that the given model fits and describes the data precisely.

The analysis further suggests that KM practice directly impacts hospital performance. Detailed evidence of the goodness of fit of the model is presented in Figure 1 and Table 6. In Figure 1, the three factors of the KM construct (Knowledge storage, Knowledge creation, and Knowledge implementation and generation) are represented by Knowledge storage, Knowledge creation, and Knowledge implementation; the three factors of the HP construct (Customer satisfaction, Financial Performance, and the working relationship) are represented by Customer Satisfaction, Financial Performance and Work Relation.

The complete Structural Equation Model (SEM) based on an estimation of the causal effects of the construct is illustrated in Figure 1. The model consists of a total of three indicators for each construct. The calculated summated scales yielded from the CFA outcomes were used to calculate a value for each indicator. The model output showed to be statistically well fit and practically significant [Root Mean Squared Error of Approximation (RMSEA) = 0.062 and Comparative Fit Indices (CFI and TLI) were robust (.962 and .957, respectively)]. Other goodness of fit indices of the model included: Chi-square (337.721), Degrees of freedom = 203;

Figure 1. The full-fledged Structural Equation Model (SEM).



p-value = .000; Norm Chi-square (C_{min}/df) = 1.664. Table 6 presents a summary of the model's goodness of fit statistics.

The output in Table 6 shows the good fit of the model. Results of all statistical tests support and recommended that the observation fit the model. The Normed- chi-square (C_{min}/df) lies within the acceptable range of 2–5 (Bollen, 2014; NE & Cudeck, 1993), RMSEA < 0.08, CFI and TLI > 0.9 (Byrne, 2016; NE & Cudeck, 1993). Moreover, every variable in the analysis contributes significantly to the prediction of the underlying factors, with unique contributions of the variables being fairly high and ranging between 83.2% and 94.9% (Byrne, 2016). The partial variance of each variable in this instrument is documented in Table 7.

Table 6. Summary of the fit statistics for the full-fledged model

Model	χ^2	D_f	P	C_{min}/df	RMSEA	CFI	TLI
Fit Statistics	337.721	203	.0000	1.664	.062	.962	.957

Table 7. Variances explained by each variable in the model (Squared Multiple Correlations)

	Estimate
Organization performance hospital Performance	0.949
Knowledge Storage	0.842
Knowledge Creation	0.832
Knowledge Implementation	0.891
Customer Satisfaction	0.855
Financial Performance	0.840
Works Relation	0.857

Table 8. Analysis of causal effects among the constructs

Determinant	Outcome	Direct	Research/ Question	Result
KM	(HP)	.92	Main Research	Supported

The parameter loadings of the model all proved logical and statistically significant. The yielded loading coefficients ranged was between 0.76 and 0.95, all above the acceptable threshold of 0.7 (Byrne, 2016; Kline, 2015). Further analysis also revealed the statistical and significant interrelatedness of the constructs, particularly the KM and HP constructs, which were highly statistically inter-related given that the Critical Ratio (CR) values of each of the inter-variable relationships (Byrne, 2016; Kline, 2015) exceeded 1.96 (6.601) (the absolute value), at 0.05% level of significance.

This model also proved the interrelatedness of the constructs. Analysis of the model suggested that KM has a favorable and statistically significant relationship with hospital performance (HP) = 0.92. The effect estimates showed to be statistically significant and logically rational and met the typical standards for evidence of direct (0.2) (Byrne, 2016; Kline, 2015). Table 8 presents accurate measures of the effects and relationships of the studied constructs.

The results were in line with previous research in the healthcare sector which found that KM has a positive effect on hospital performance (Achmad & Grace, 2019; Chen, 2017; Karamat et al., 2019; Wu & Hu, 2012). Furthermore, the results were in line with previous research which are focus on the relation between KM and HP in general (Cai et al., 2019; Nzewi & Moneme, 2016; Overby et al., 2005; Sambamurthy et al., 2003; Worley & Lawler, 2010). The results were also supporting the new trend in the quality system standards and the quality awards to include the KM in their criteria and requirements.

6. Conclusion

In our current study, a series of extensive analyses all revealed the vital role of KM in improving hospital performance and customer satisfaction and encouraging hospital success. The model employed in our current study may be of efficacious use to all hospitals, and Abu Dhabi hospitals, which seek to assess performance in a way that meets international accreditation standards. Nonetheless, the results of this study lack generalizability, and this is a result of the small sample size and geographical area covered, the presence of desirability biases in the respondents answers, the lack of sufficient work and hospital experience of the respondents, and the presence of common method variance/biases. Our current study has been effective in recognizing the significance of KM in improving hospital performance and customer satisfaction and has paved the way for any future works that wish to further explore the complex yet essential role of KM.

These days healthcare sector in developing countries is facing many problems related to quality and cost of their services, knowledge management as a leverage to improve the service quality level and to reduce the service cost is the main message which can be concluded from this paper. Furthermore, knowledge management becomes a very important part in most of the quality management systems for example, KM is added to ISO9001 and it is one of the main criteria of most of the excellence quality Awards, that is because the importance of its rule on the organization performance. Hospitals and healthcare sectors in developing countries are encouraged to develop their knowledge management tools by focusing on the factors which are considered in this paper to improve their performance.

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