APPLICATIONS OF KNOWLEDGE MANAGEMENT IN HEALTH CLUSTERS IN SAUDI ARABIA

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Summary:

Kingdom of Saudi Arabia strategically adopts the best approaches to transform its healthcare system, aligning with global health service standards. Additionally, it recognizes the pivotal role of the Ministry of Health as the legislative and regulatory authority in the healthcare sector. This alignment is based on the strategic goals of Saudi health clusters, derived from Vision 2030, which aims to transition to a knowledge-based economy. Notably, health clusters have embraced knowledge management as a modern department to organize and leverage health-related knowledge, thereby achieving the Kingdom's Vision 2030 targets.

The present study investigates the applications of knowledge management within Saudi health clusters. These clusters bear the responsibility of safeguarding the health of citizens and residents in Saudi Arabia, providing exceptional care. The study focuses on a case study of Makkah health cluster, which pioneers the establishment of a dedicated knowledge management unit. By setting specific research objectives, the study aims to reveal the current state of knowledge management in Makkah Health Cluster, explore knowledge practices and highlight challenges hindering effective knowledge management.

The study employed a descriptive survey methodology, utilizing interviews to collect necessary information through a set of open-ended questions. The study sample consisted of (13) leaders working in Makkah health cluster during the summer of 2023. Among the significant findings, there is a notable interest in health-related knowledge management within Makkah health cluster. The researcher recommends implementing initiatives and programs to activate the desired role of knowledge management in light of Vision 2030.

Keywords: Knowledge Management, Health Knowledge Management

1. Introduction and Problem Statements

The recognition and effective management of knowledge have become crucial strategic resources for leading organizations, serving as sustainable competitive advantages, and contemporary organizations are racing to adopt and apply knowledge concepts, especially in light of technological advancements supporting their activities.

However, the Kingdom of Saudi Arabia follows the best strategies to transform its healthcare system, aligning it with the global health services sector. It also aligns with the role of the Ministry of Health as the legislative and regulatory body for the healthcare sector. The strategic goals and foundations of Saudi health clusters are derived from Vision 2030, aiming to transition toward a knowledge-based economy. These health clusters have emphasized the concept of knowledge management as a modern administration, organizing and leveraging health-related knowledge to achieve the targets set by Vision 2030 for Saudi Arabia. (Alharthi, 2022)

The field of healthcare is characterized by diverse and abundant knowledge sources, underscoring the importance of effectively discovering and making medical knowledge accessible for utilization. Achieving the goals and objectives of the healthcare sector relies on this knowledge, prompting a keen focus on safeguarding and leveraging knowledge assets. This, in turn, ensures the optimal production of products and services for patients.

The study in question stems from the researcher's accumulated experience in knowledge management. During his collaboration with the Makkah Health Cluster and other organizations, the researcher observed that these entities possess substantial knowledge. However, this knowledge remains underutilized or inaccessible, either due to inadequate utilization practices or because employees struggle to discover and access it easily.

Despite the availability of technical and cognitive infrastructure, in addition to the trend towards implementing and applying the concept and processes of knowledge management, which urges the need to find appropriate solutions and practices to support the implementation of knowledge management applications in the health cluster in Makkah, the problem has been identified based on a review of intellectual production, revealing a scarcity of studies related to the problem topic.

One of these studies is Alkinaidri (2023) He adopted a case study methodology using qualitative analysis tools and surveys to understand the state of knowledge management in the King Abdullah Medical City y, followed by interviews to identify needs.

One of the most important findings of the study is the production and design of a new knowledge portal model through a redesigned interface to support knowledge management processes in the healthcare sector. The researcher also proposed a framework for integrating knowledge mapping technology into the stages of building knowledge portals. A significant recommendation is the necessity of adopting the construction of a knowledge portal within the strategic objectives of health clusters at the national level, along with studying the obstacles to implementing knowledge management.

Another study is Alharthi (2022) The study employed three research methods (qualitative content analysis, multiple case studies, and focus group method) to explore the state of customer knowledge management within the Hajj and Umrah system.

Key findings include the awareness and interest of the Hajj and Umrah system in customer knowledge management. The researcher proposed a model to enhance the experience of pilgrims by utilizing smart technologies for managing their knowledge. A notable recommendation is to adopt the proposed model and facilitate access to pilgrims' knowledge through an integrated mechanism within the Hajj and Umrah system. The information mentioned above prompted the researcher to conduct the current study, given the need to support knowledge management applications in Healthcare Clusters in the Kingdom of Saudi Arabia. The study focuses on a case study of the Makkah Health Cluster as a relevant community for investigation.

Consequently, the study identified its problem through the primary question: What are the applications of knowledge management in Makkah Health Cluster? The study aims to provide

comprehensive insights into the reality of knowledge management within Makkah Health Cluster by accomplishing the following objectives:

1- Reveal the Current State of Knowledge Management in Makkah Health Cluster.
2- Explore Knowledge Practices in Makkah Health Cluster.
3- Highlight the challenges that hinder effective knowledge management within the Makkah Health Cluster.

2. Literature review

- Health Knowledge Management:

The term "Health Knowledge Management" refers to a set of processes aimed at acquiring health-related knowledge, including discovery, ownership, and sharing. It encompasses both tacit knowledge (existing in individuals' minds) and explicit knowledge (existing in documents and databases).

Knowledge management is a hallmark of contemporary organizations. Its execution relies on several key processes, which can be summarized as follows:

a. Discovery process: This involves identifying, diagnosing, and extracting knowledge. It helps determine the type of existing knowledge and specifies the desired knowledge. Additionally, it facilitates identifying experts and knowledge sources.

b. Storage process: Knowledge storage and documentation are essential. This process encompasses preservation, study, access, and retrieval of knowledge. Organizing knowledge in a way that facilitates easy access and retrieval ensures its future utilization.

c. Sharing process: Through communication channels, knowledge is disseminated to others. Sharing knowledge within an organization's memory enriches the exchange of insights among individuals or between experts and clients.

d. Application process: Organizations utilize their knowledge to create tangible products, solve problems, make informed decisions, or gain a competitive advantage. This process contributes to improved performance and cost reduction. (Alharthi, 2023)

- Knowledge management challenges:

Several challenges hinder effective knowledge management:

1. Individual Obstacles: Resistance from employees, varying expertise levels, insufficient incentives, and time constraints.

2. Organizational Barriers: Cultural factors, resource limitations, and lack of top management support.

3. Technological Constraints: Inadequate technological infrastructure, limited technical support, and training. (Magdy et.al, 2021)

- Healthcare Strategy in Saudi Arabia:

The Saudi Ministry of Health's healthcare strategy aims to achieve optimal health services, reduce disease rates, and ensure equitable access to healthcare for all Saudi citizens. Key aspects of this strategy include:

1. Funding: Diversifying funding sources for healthcare activities alongside public resources.

2. Health Information Systems: Implementing modern health information and management systems to enhance service efficiency, quality, and cost-effectiveness.

3. Workforce Development and Rights Protection: Preparing and developing healthcare professionals to ensure high-quality services and self-sufficiency in the national workforce while emphasizing training.

4. Management and Operations: It aims to develop management and operational systems in healthcare facilities to suit the nature of healthcare services as vital and direct, requiring quick decision-making and efficiency in performance, along with reducing procedures.

5. The role of the Ministry of Health and other governmental health Entities: Carrying out the tasks specified by the health system as the entity responsible for providing healthcare. Other health authorities assist the ministry in providing care.

6. Private Sector Engagement: It aims to enhance the role of the private sector in the healthcare system by achieving full integration with the government sector in providing healthcare services. This includes participation in establishing, managing, and operating facilities..

7. Primary Healthcare: It aims to develop primary healthcare services and enhance their efficiency to achieve the satisfaction of beneficiaries and distribute them equitably. It also aims to facilitate access for all members of society regardless of funding.

8. Emergency Services: Enhancing the quality of medical emergency services to meet regular and disaster-related needs through a national emergency system that ensures quick and effective response.

9. Therapeutic and Rehabilitation Care: Preparing hospitals to provide medical services and comprehensive rehabilitation care for various disabilities and age groups.

10. Health Services Distribution: The aim is to achieve a balanced geographical and population-based distribution of health services that meets the health needs of all segments of society. These services should be accessible to those in need, with facilitated access.

11. Ensuring Quality and Efficiency of Health Services and Evaluation: This objective focuses on providing efficient preventive, curative, and rehabilitative health services. It also emphasizes the suitability of training for healthcare workers in health centers and institutions to meet the requirements of healthcare work.

12. Patient Protection and Safeguarding Their Rights: The goal is to protect patients' rights and shield them from incorrect healthcare practices. It ensures that healthcare practitioners adhere to ethical standards and correct healthcare practices. (Saudi Health Council, n.d)

3. Methodology and Approaches:

Study Methodology: This study adopts a descriptive survey methodology, aligning with the nature of the research. Descriptive surveys are a type of research that involves questioning individuals from the study sample to describe the studied phenomenon. It focuses on understanding the phenomenon without delving into causality or drawing inferences. The study aims to answer research questions and explore knowledge management applications within the Makkah Health Cluster.

Study Tool:

The study primarily uses semi-structured interviews as the main data collection tool. Interviews are prepared based on open-ended questions branching from the main research question, drawing from relevant literature and related studies.

Interviews are suitable for qualitative studies, allowing targeted conversations with specific goals. They provide insights into respondents' opinions and are considered one of the most reliable research methods.

Study Population and Sample:
The study population consists of Healthcare Cluster management in Makkah. The study sample was selected purposively. Thirteen leaders responded to the interviews, while others from eight executive departments of the health cluster in Makkah declined participation.

Study Boundaries:
Subject Boundaries: The study discusses knowledge management applications.
Spatial Boundaries: The study was conducted within Makkah Healthcare Cluster, represented by executive departments and affiliated units.
Temporal Boundaries: The study was conducted during the summer of 2023.

4. Results and Discussion
The study aimed to answer the main question: **What are the knowledge management applications in Makkah Health Cluster?** It explored sub-questions related to the current state of knowledge management.

Please note that the study's focus is on description rather than causal relationships or cause-and-effect analysis.

First Question Axis: The reality of knowledge management in Makkah Healthcare Cluster.
The following is an overview of the reality of knowledge management in the health cluster in Makkah , Saudi Arabia, through several sub-questions, aimed at obtaining comprehensive and sufficient answers, as follows:
a) What is the primary role of Makkah Health Cluster's departments?
The responses of the study sample regarding the role of the health cluster departments in Makkah were analyzed and classified according to the strategic principles of healthcare in the Kingdom of Saudi Arabia. This can be identified in Table (1):

Strategic foundations	Repetition
Health Services	7
Management and Operations	6
Information Systems and Technology	5
Workforce and Rights Protection	4

Patient Protection and Rights	4
Primary Healthcare	3
Therapeutic and Rehabilitation Care	3
Emergency Services	2
Funding	1

Table (1): The role of the health cluster departments in Makkah

Most of the departments in Table (1) agreed to play a primary role in healthcare services, mentioned (7) times. This can be attributed to the significance of healthcare services in achieving geographic and demographic balance, thereby meeting patients' health needs while ensuring service quality.

The other principles varied in descending order of occurrences after healthcare services as follows: Management and Operations, Information Systems and Technology, followed by an equal occurrence of Workforce and Rights Protection with Patient Protection, as well as an equal occurrence of Primary Healthcare with Therapeutic and Rehabilitation Care. Emergency Services followed, and finally, Funding had the lowest occurrence, appearing only once.

b) What is the level of awareness regarding knowledge management in Makkah Health Cluster's departments?

Table (2) illustrates the responses of the study sample to this question regarding the awareness of knowledge management:

The level	Repetition of awareness
High	1
Middle	6
Low	6

Table (2): The extent of health cluster departments' awareness of knowledge management

The sample study responses in Table (2) shed light on the awareness levels regarding knowledge management. Notably, there was only one high-level response, represented by the Knowledge Management unit within the health cluster in Makkah. This unit is dedicated to increasing awareness about the importance of knowledge utilization and optimal ways to employ it to achieve the cluster's vision of becoming a knowledgeable community.

Medium and Low Awareness: Both levels occurred six times each. This variation indicates differing levels of awareness among the Makkah Health Cluster's management departments regarding the nature of knowledge management and its applications.

c) Is there a knowledge management system in the Makkah Health Cluster's departments?

Through questioning the sample individuals, some responses indicated the absence of a knowledge management system, whether administrative or technical, in the health cluster departments. Meanwhile, other departments within the health cluster indicated the presence of a knowledge management system and its applications, as follows:

- **Knowledge Management:** There exists an administrative system that includes policies and procedures for implementing knowledge management within Makkah Health Cluster. This unit is dedicated to enhancing awareness about the importance of utilizing health knowledge optimally.
- **Innovation Management:** A dedicated platform for managing innovations, facilitating idea exchange.
- **Transformation Office:** Utilizes a Smart Sheet platform to document all transformations and projects, extracting necessary evaluation reports.
- **Digital Health Management:** Owns a platform for sharing data and information among Makkah Health Cluster staff, along with official templates for users.
- **Beneficiary Experience Management:** Has a specialized platform for sharing diverse knowledge.
- **Decision-Making Management:** Adheres to an information policy, sharing data for evaluation through distributed Data Sets across the health cluster departments.

Second Question Axis: Best Knowledge Practices in Makkah Healthcare Cluster:

The study sample was queried through several sub-questions to understand knowledge practices comprehensively.

a. What are the best knowledge practices?

The responses from the sample study participants highlighted both general and health-specific best knowledge practices. These practices are summarized in Table (3), with a total of (21) identified practices:

Departments	knowledge practices	
	Health	General
Knowledge Management	1	1
Research Management	1	-
Innovation Management	1	1
Transformation Office	-	1
Modern Healthcare Model Management	1	1
Primary Healthcare Centers Management	1	-

Public Health and Preventive Health Management	1	-
Beneficiary Experience Management	1	1
Decision-Making Management	1	1
Quality Management	1	1
Digital Health Management	1	1
Human Resources Management	1	-
Hajj and Umrah Management	1	1
Total number of Knowledge Practices	12	9
	21	

Table (3): Knowledge practices in Makkah Health Cluster

Health knowledge practices topped the list in Table (3) over general knowledge practices in terms of repetition, with a total of (12) occurrences, as shown in Table (3). Here are some of the prominent health knowledge practices:

Health-Specific Practices (12) occurrences:
✓ Practical clinical training while working.
✓ Health training programs for employees, aimed at providing practical knowledge to enhance work quality (e.g., educating medical interns).
✓ Lectures and workshops on handling new epidemics, disseminated through electronic channels.
✓ Educational courses for healthcare practitioners regarding common diseases during Hajj and Umrah seasons.
✓ Awareness programs for pilgrims emphasizing the importance of maintaining health for fulfilling religious obligations.

General Practices (9) occurrences:
✓ Encouraging the use of electronic platforms for health-related Hajj documentation storage and easy retrieval.
✓ Directing managers and staff to share knowledge with new employees, fostering a conducive work environment.
✓ Weekly problem-solving meetings and discussions with work teams to exchange knowledge.
✓ Pre-employment guidance, educational sessions, and workshops for volunteers to ensure skill acquisition.

b. What is the mechanism for benefiting from knowledge practices?

Through analyzing the responses of the study sample regarding the mechanism for benefiting from knowledge practices, it becomes evident that there are several mechanisms, as represented in Table (4):

Knowledge Methods	Frequency
Training	5
Meetings	4
Workshops	4
Knowledge Dissemination	2
Reports	2
Business Intelligence	1

Table (4): Mechanisms for leveraging from Knowledge practices

The sample responses exhibit varying frequencies. Training stands out as the most commonly used method for knowledge transfer, mentioned five times. Meetings and workshops share the second position, each with four mentions. Similarly, reports and knowledge dissemination are equally cited four times. Business intelligence techniques are mentioned uniquely once.

c. What role does knowledge management play in supporting operations and processes?
The responses from the study sample regarding the role of knowledge management are encapsulated in the following knowledge processes, as shown in Table (5):

Knowledge Processes	Frequency
Knowledge Sharing	7
Knowledge Storage	4
Knowledge Discovery	3
Knowledge Application	3

Table (5): The role of knowledge management in supporting works of Makkah Health Cluster

In Table (4), knowledge sharing process ranked highest in terms of repetition, mentioned (7) times. The responses indicated sharing both health and general knowledge with the staff of the health cluster to improve performance and develop continuous improvement plans.
The second-ranking process is **knowledge storage**, mentioned (4) times. Responses highlighted organizing, categorizing, and storing health and general knowledge for easy accessibility and reference during operational tasks.

As for knowledge discovery and Application, both processes share an equal frequency of three mentions each. However, knowledge is considered the key to future thinking and planning, especially in the healthcare sector.

Third Question Axis: Challenges in Knowledge Management Applications

In this section, we will review the challenges that hinder the utilization of knowledge management in healthcare operations within the Makkah Health Cluster. These challenges span three domains, as outlined in Table 6:

Challenges	Organizational	Technological	Human Resources
Frequency	6	3	2

Table (6): Challenges of managing knowledge applications

The responses of the study sample varied in Table (6) in terms of frequency, with organizational challenges dominating as obstacles to knowledge management in the operations of the health cluster, mentioned (6) times. The second rank was occupied by technological challenges, mentioned (4) times, and human challenges also appeared (2) times. Here are some of the prominent challenges:

1) **Awareness Gap**: Insufficient awareness regarding the significance of knowledge management applications as contemporary concepts within Makkah Health Cluster.

2) **Current Knowledge Management Unit Structure**: The existing knowledge management unit within Makkah Health Cluster should ideally be a strategic management entity well-informed about all plans, targets, and opportunities.

3) **Skilled Workforce Shortage**: The lack of specialized workforce dedicated to knowledge management within Makkah Health Cluster operations, impacting the activation of effective work procedures.

4) **Incentive Systems**: Absence of comprehensive material and motivational incentive systems to encourage employee initiative and knowledge sharing within Makkah Health Cluster.

5) **Neglect of Knowledge Governance and Protection**: Insufficient attention to governing and safeguarding knowledge within the health cluster.

6) **Accessibility Challenges**: Difficulties in accessing knowledge when needed.

7) **Complexity of Knowledge Control**: Managing knowledge within the intricate system of Makkah Health Cluster proves challenging.

8) **Lack of Integrated Technological Infrastructure**: The absence of a comprehensive, integrated technological system for knowledge storage and updates within Makkah Health Cluster.

9) **Unified Platform Absence**: The lack of a unified platform for collecting and documenting information and knowledge within Makkah Health Cluster.

10) **Lack of Comprehensive Technological Knowledge Management System**: There is a need for an integrated technological knowledge management system within Makkah Health Cluster.

5. Conclusion and Recommendations

The current study provides an insightful view of the status of knowledge management applications in the health cluster in Makkah , emphasizing the need for integrated strategic knowledge initiatives to enhance healthcare services in the cluster. The results of interviews with the study sample confirmed the necessity of activating the role of knowledge management in the health cluster in Makkah overall, especially in patient healthcare services. The findings of this study and the following recommendations serve as a foundation for future knowledge-based activities and initiatives aimed at improving the healthcare system. The researchers concluded a set of proposals and recommendations in the following context:

- Preparation of an annual plan for developing knowledge management in the health cluster in Makkah by relevant departments.
- Implementation of a communication program to discuss the mechanism of raising awareness about knowledge management in the health cluster and related entities.
- Issuance of a system to incentivize knowledge sharing through promoting knowledge management ambassadors within the health cluster.
- Establishment of an interactive platform or an effective knowledge gateway to serve knowledge management in the health cluster.
- There should be a real presence of knowledge management in the healthcare field to transfer experiences, identify best practices, and document them.
- Organizing workshops after the completion of healthcare projects to document healthcare and general knowledge and optimize their utilization.
- The necessity of using artificial intelligence techniques and other modern technologies in managing this knowledge.

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