

Knowledge Spiral: A Leadership-Level Assessment of Knowledge Practices in Makkah Health Cluster

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Abstract

While Knowledge Management (KM) is critical for High-Reliability Organizations (HROs) like modern healthcare clusters, evaluative, leadership-focused research in the Saudi context remains scarce. This study provides a leadership-level assessment of KM effectiveness within Makkah Health Cluster (MHC), a key component of Saudi Arabia's Vision 2030 health sector transformation, to identify barriers hindering its contribution to organizational performance.

A qualitative study was conducted with 13 senior leaders at MHC. Data was collected through semi-structured interviews and subsequently analyzed using a quantitative content analysis approach. In this two-stage process, qualitative themes were first identified, then systematically coded and quantified to measure their prevalence and intensity across the leadership cohort. The Nonaka and Takeuchi SECI model served as the guiding theoretical framework.

The findings reveal a significant paradox: leaders universally acknowledge KM's strategic potential but perceive its current implementation as fragmented. A fragmented and non-integrated technological infrastructure of KM was the most significant barrier, identified in 92.3% of interviews. This was followed by a lack of incentives for knowledge sharing and insufficient organizational awareness (both identified in 76.9% of interviews). These foundational barriers have hindered the knowledge creation spiral, particularly impeding the Externalization (articulating tacit knowledge) and Combination (systematizing explicit knowledge) processes.

KM at MHC is in a state of unrealized potential. The study concludes that without a deliberate, top-down strategic intervention to build a cohesive governance framework, a unified technological platform, and a supportive organizational culture, KM will remain a collection of ad-hoc activities rather than a core driver of organizational performance and high reliability.

Keywords: Knowledge Management, Knowledge Practices, Healthcare Management, Makkah Health Cluster, Saudi Vision 2030.

1. Introduction

In the high-stakes environment of healthcare, the failure to manage knowledge is not merely an operational inefficiency; it can have direct consequences on patient outcomes. A single piece of unshared knowledge -a lesson learned from a near-miss, a best practice refined through experience, or a critical insight about a patient's condition- can be the difference between a medical error and a life saved. It is within this critical context that High-Reliability Organizations (HRO) like Saudi Arabia's health clusters must transform from being data-rich to knowledge-driven.

In contemporary healthcare systems, knowledge constitutes a critical strategic asset that directly influences patient safety, clinical excellence, operational efficiency, and organizational learning. The complexity of healthcare -characterized by multidisciplinary teams, emerging diseases, and constantly evolving guidelines- makes KM not just beneficial but indispensable (Nonaka & Takeuchi, 1995). The Kingdom of Saudi Arabia's Vision 2030 places a strategic emphasis on transforming its healthcare system, with health clusters playing a pivotal role in achieving a knowledge-based economy. Within this context, MHC plays a distinctive national role, serving both residents and millions of seasonal pilgrims. The effectiveness of KM in such a setting is therefore critical for service continuity, risk mitigation, and organizational resilience.

Despite the recognized importance of KM, a gap persists between its theoretical promise and practical reality. Existing research in the Saudi healthcare context, while valuable, is often descriptive (e.g., Alharithi, 2022), narrowly focused on specific tools (e.g., Alkinaidri, 2023), or captures managerial rather than strategic leadership perspectives (e.g., Alboliteh et al., 2023). This study addresses this critical gap by providing the first in-depth, leadership-based evaluation of KM effectiveness within the unique and high-stakes environment of MHC, setting the stage for a deeper investigation into the underlying barriers to success.

2. Research Rationale

This research is driven by a critical need to bridge the gap between the theoretical promise of KM and its practical implementation within the high-stakes environment of Saudi healthcare. This need is informed by three interconnected rationales:

First, the prevailing gap in evaluative, leadership-focused research: A comprehensive review of the literature (Alsalmi, 2024) reveals that while KM research in the Saudi healthcare context is growing, it remains predominantly descriptive or narrowly focused. Many studies offer valuable frameworks (Almuayqil et al., 2015), conduct broad reviews (Bashrahil, 2017; Albaladi, 2019), or explore specific applications like knowledge portals (Alkinaidri, 2023) and customer knowledge (Alharithi, 2022). Even the few evaluative studies, such as the quantitative survey by Alboliteh et al. (2023), focus on managerial perceptions of performance rather than a deep, qualitative assessment of KM effectiveness from a

strategic leadership viewpoint. This study fills this critical void by providing a rigorous, theory-driven, and leadership-centered evaluation.

Second, the strategic and unique context of MHC: As a cornerstone of Saudi Arabia's Vision 2030 health sector transformation, MHC operates in an environment of unparalleled complexity. Its dual mandate to provide high-quality care to a large resident population while also serving millions of international pilgrims during Hajj and Umrah seasons elevates it to the status of a High-Reliability Organization (HRO), where failures in knowledge sharing can have severe consequences. The strategic importance of ensuring service continuity, managing public health risks, and fostering organizational resilience makes an in-depth evaluation of its KM capabilities a national priority.

Finally, the motivation for this study also stems from the researcher's observations as a collaborative consultant with MHC. A noticeable disparity was observed between the organization's stated commitment to KM and the tangible reality of its implementation. Despite possessing significant knowledge assets and technological infrastructure, knowledge frequently appeared siloed, underutilized, or inaccessible. This research was designed to move beyond anecdotal evidence and systematically investigate this perceived gap between potential and performance, using a scholarly lens to diagnose the underlying barriers.

This research addresses the following central question: How effective are Knowledge practices within MHC from the perspective of its leaders?

To answer this question, the study pursues three primary objectives:

- 1) To examine the current state of Knowledge practices within MHC across five key dimensions.
- 2) To identify the primary challenges hindering the implementation of effective Knowledge practices.
- 3) To assess leadership perceptions regarding the contribution of Knowledge practices to organizational performance.

By achieving these objectives, this research contributes both academically and practically by offering a leadership-based evaluation of KM maturity in a major healthcare cluster, providing actionable insights for strategic improvement.

3. Literature Review

3.1 Knowledge Management in Healthcare

Knowledge Management has emerged as a critical capability for healthcare organizations seeking to improve patient outcomes, operational efficiency, and organizational learning. The healthcare sector is inherently knowledge-intensive, with clinical decisions relying on the effective integration of explicit knowledge (research evidence, clinical guidelines) and tacit knowledge (professional judgment, experiential learning). Healthcare Knowledge Management (HKM) 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".

Nonaka and Takeuchi (1995) argue that organizations that excel at creating and leveraging knowledge gain sustainable competitive advantages, a principle that is particularly relevant in healthcare where knowledge gaps can have life-or-death consequences. While the term Knowledge Practices Effectiveness refers to how well an organization identifies, organizes, shares, and applies knowledge to achieve strategic objectives. Alharthi (2022) defines KM as a hallmark of contemporary organizations, HKM Effectiveness is often evaluated using four core processes, which can be summarized in Figure 1:

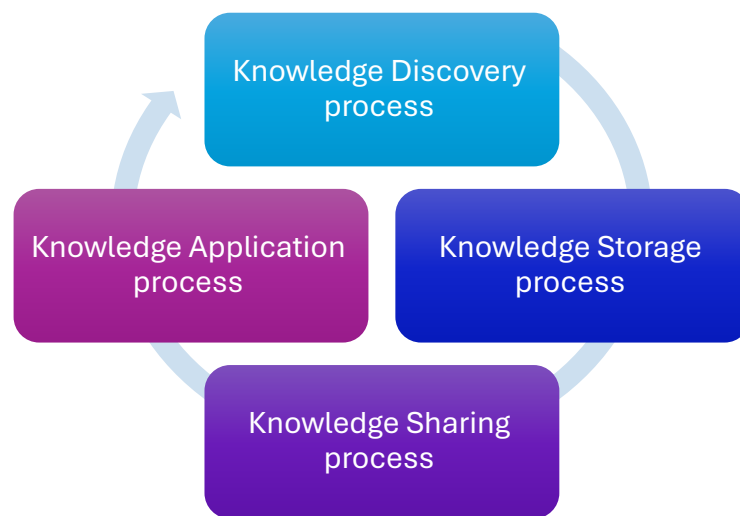


Figure 1 Knowledge Management Processes

Knowledge Practices is operationalized through interconnected processes that collectively determine its effectiveness. Knowledge discovery focuses on identifying, diagnosing, and extracting both existing and required knowledge, including best practices, lessons learned, and expert insights. Knowledge storage ensures the systematic documentation, organization, preservation, and retrieval of knowledge in a manner that supports accessibility and future reuse. Knowledge sharing facilitates the dissemination of knowledge through formal and informal communication channels, enriching organizational memory and enabling cross-departmental exchange; it is widely regarded as one of the most frequently used indicators of knowledge practices effectiveness. Knowledge application represents the culmination of these processes, whereby knowledge is utilized to inform decision-making, solve problems, enhance performance, and reduce costs, and it is considered the ultimate indicator of KM success, as knowledge that does not influence practice remains ineffective. Collectively, effective Knowledge Practices translate into higher diagnostic accuracy, improved patient safety, reduced clinical errors, faster decision-making, and enhanced coordination and continuity of care. Empirical research further indicates that such effectiveness is significantly stronger

in organizations characterized by clear knowledge governance structures and sustained leadership engagement.

3.2 Knowledge Practices Challenges

Despite its benefits, implementing effective Knowledge Practices in healthcare is fraught with challenges, which can be categorized into three main domains

Individual Obstacles, Organizational Barriers and Technological Constraints, see Figure 2:



Figure 2 Knowledge Practices Challenges

Prior research identifies several recurring barriers that limit the effectiveness of knowledge practices in healthcare organizations, which are further intensified by sector-specific conditions such as rotating staff, high workloads, and strict clinical time constraints. These barriers generally span individual, organizational, and technological dimensions. At the individual level, resistance to change, variations in expertise, insufficient incentives, and limited time availability hinder knowledge-sharing behaviors. Organizational barriers include cultural constraints, resource limitations, and weak top management support, all of which undermine the institutionalization of knowledge practices. Technological constraints, such as inadequate infrastructure, limited technical support, and insufficient training, further restrict knowledge accessibility and integration. Collectively, these challenges significantly impede the effectiveness of knowledge practices in healthcare settings. (Magdy et al., 2021)

3.3 Knowledge Management in Saudi Healthcare Context

The Saudi healthcare sector has undergone significant transformation as part of Vision 2030, with health clusters emerging as a key organizational model. However, research on KM practices within this context remains limited and largely descriptive. Several studies have explored the role and application of KM in the

Saudi healthcare sector from various perspectives. Almuayqil et al. (2015) were among the pioneers in applying the SECI model to propose a comprehensive framework for e-healthcare, aiming to overcome implementation barriers by integrating KM with knowledge discovery techniques. This foundational work highlighted the importance of a structured approach to knowledge creation. Following this, Bashrahil (2017) and Albaladi (2019) conducted literature reviews that reinforced the importance of KM, with the former focusing on the general requirements for KM application and the latter confirming a strong link between Customer Knowledge Management (CKM) and service quality.

More recent studies have shifted towards empirical investigation. Alharithi (2022) explored the use of smart technologies for CKM in the specialized context of Hajj and Umrah, revealing high awareness of KM's importance but a lack of dedicated CKM departments. In a similar vein, Alkinaidri (2023) conducted a case study at MHC, finding that KM maturity was moderate and heavily skewed towards technological and operational aspects, leading to the development of a successful knowledge portal prototype. Moreover, Alboliteeh et al. (2023) provided a quantitative assessment in Hail hospitals, surveying 210 managers and finding a strong positive correlation between KM practices and sustainability performance, with managers rating their own KM capabilities as "excellent". Most recently, Alsalmi (2024) conducted a broad literature review of 51 studies, concluding that technology and customer focus are critical for service development.

3.4 Makkah Health Cluster

Makkah Health Cluster was founded in 2017 in alignment with KSA's Vision 2030, as a partner in the Saudi Ministry of Health Transformation Strategy. provides health care services to more than million beneficiaries, through 118 primary care centers, medical City, and 14 general and specialized hospitals with a total bed capacity of 3,094 beds. MHC is a prime example, tasked with the unique and complex dual responsibility of providing comprehensive healthcare to the resident population of Makkah and ensuring the health and safety of millions of pilgrims during the annual Hajj and Umrah seasons. (Makkah Health Cluster, n.d.)

3.5 Synthesis and Research Gap

The literature reveals three key patterns. First, there is a convergence on the importance of technology as a critical enabler of KM. This is a consistent theme across the studies, from the early framework of Almuayqil et al. (2015) to the recent portal development by Alkinaidri (2023) and the broad review by Alsalmi (2024). Second, there is a divergence in the perceived level of KM maturity and awareness. While Alboliteeh et al. (2023) reported an "excellent" level of KM among managers in Hail, Alkinaidri (2023) found KM maturity to be only "moderate" in Makkah, and Alharithi (2022) noted a complete lack of a dedicated CKM department despite high awareness. This suggests that KM implementation is highly variable and context-dependent across different healthcare institutions and organizational levels.

Third, and most critically, there is a clear gap in leadership-focused, theory-driven evaluations. The majority of the studies are either descriptive literature reviews (Alsalmi, 2024; Albaladi, 2019; Bashrahil, 2017) or focus on specific operational aspects like CKM (Alharithi, 2022) or knowledge portals (Alkinaidri, 2023). While Alboliteeh et al. (2023) surveyed managers, their quantitative approach treated KM as a set of variables rather than examining the strategic leadership perspective on its effectiveness. Furthermore, with the notable exception of Almuayqil et al. (2015), the existing literature has not explicitly integrated the SECI model or the enabling context of Ba to understand the dynamic processes of knowledge creation. This study addresses this gap by providing a rigorous, theory-driven assessment of KM practices at MHC from a leadership perspective, using a mixed qualitative-quantitative approach and employing the Nonaka and Takeuchi SECI model as the guiding theoretical framework. to systematically evaluate the current state and identify actionable barriers to creating a robust knowledge spiral.

4. Theoretical Framework and Conceptual Model

This study is theoretically grounded in Nonaka and Takeuchi's (1995) seminal work on organizational knowledge creation, specifically the Socialization, Externalization, Combination, and Internalization (SECI) model. This framework was selected for its robustness in explaining how knowledge is created, shared, and amplified within an organization, making it highly relevant for assessing the effectiveness of knowledge practices at MHC .

4.1 The SECI Model of Knowledge Creation

The SECI model posits that organizational knowledge is created through a dynamic, spiraling process involving the conversion between two types of knowledge. Critically, the core tenets of HRO -preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise (Weick & Sutcliffe, 2015)-are fundamentally knowledge-intensive processes. A preoccupation with failure, for instance, requires a robust Socialization process where near-misses are openly shared and discussed in safe environments. Reluctance to simplify demands continuous Externalization, where complex tacit understandings are articulated and challenged. Deference to expertise is contingent on effective Combination, where expert knowledge is systematically organized and made accessible to decision-makers at all levels. Therefore, a functioning SECI knowledge spiral is not just a desirable organizational feature but a prerequisite **for** achieving and sustaining high reliability in a healthcare setting. Without it, the organization cannot learn from its experiences, adapt to emerging challenges, or leverage its collective expertise effectively.

The SECI model further posits that organizational knowledge is created through a dynamic, spiraling process involving the conversion between two types of knowledge: **tacit** (personal, context-specific, hard to formalize) and **explicit** (codified, systematic, easy to communicate). This process unfolds through four modes of conversion:

- 1) **Socialization (Tacit to Tacit):** Creating and sharing tacit knowledge through direct experience, observation, and interaction. In MHC context, this includes mentorship, on-the-job training, and informal consultations.
- 2) **Externalization (Tacit to Explicit):** Articulating tacit knowledge into explicit concepts. This involves creating models, writing reports, or developing clinical guidelines based on personal expertise.
- 3) **Combination (Explicit to Explicit):** Systematizing and combining different bodies of explicit knowledge. This occurs when MHC leaders synthesize data from various reports, databases, and documents to create new strategic plans or performance dashboards.
- 4) **Internalization (Explicit to Tacit):** Embodying explicit knowledge into tacit knowledge through practice and learning-by-doing. This happens when staff read a new protocol (explicit) and, through application, it becomes part of their professional practice (tacit).

Nonaka and Takeuchi (1995) also introduced the concept of 'Ba' (roughly translating to 'place' or 'context'), which represents the shared context in which knowledge is created, shared, and utilized. The effectiveness of the SECI spiral is highly dependent on the quality of 'Ba'.

4.2 Conceptual Model for Assessing Knowledge Practices at MHC

To operationalize this framework for MHC context, this study proposes a conceptual model (Figure 1) that integrates the SECI process with the five dimensions of knowledge practices and the challenges identified in the initial qualitative phase. In this model, the five dimensions are conceptualized as the core components of MHC's 'Ba'- the enabling (or disabling) conditions that shape its knowledge creation capabilities.

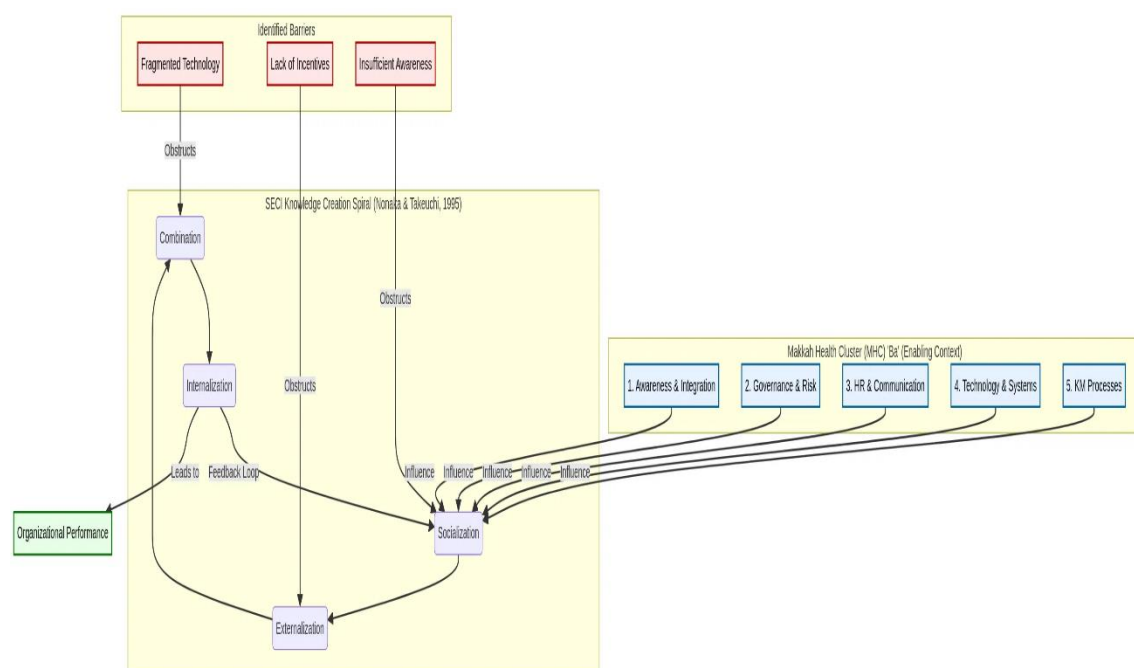


Figure 3 Conceptual Model of Knowledge Practice Effectiveness at MHC.

The five dimensions (Awareness & Integration, Governance, HR & Communication, Technology, and KM Processes) constitute the organizational 'Ba' (enabling context). When these dimensions are strong, they facilitate the SECI knowledge spiral (Socialization → Externalization → Combination → Internalization). However, barriers (Individual, Organizational, Technological) can obstruct this spiral, leading to reduced organizational performance and compromised high reliability.

This model illustrates that the effectiveness of knowledge practices at MHC is a function of how well the enabling conditions ('Ba') facilitate the SECI knowledge spiral, while navigating the identified barriers. The study's findings will be analyzed through this lens to provide a theoretically grounded assessment.

4.3 Theory-Driven Research Questions

Based on this conceptual framework, the original research objectives were refined into the following theory-driven questions:

- 1) **RQ1:** To what extent do the current enabling conditions (i.e., the five dimensions of KM practice) at MHC facilitate or impede the organizational knowledge creation process as described by the SECI model?
- 2) **RQ2:** How do individual, organizational, and technological barriers specifically obstruct the four modes of knowledge conversion (Socialization, Externalization, Combination, Internalization) within MHC?
- 3) **RQ3:** From the leadership's perspective, how does the current effectiveness of the SECI spiral at MHC contribute to organizational performance and strategic objectives?

5. Methodology

This study employed a qualitative research design that incorporated quantitative content analysis to systematically analyze and quantify leadership perceptions of Knowledge practices at MHC. This approach allows for both a deep, nuanced exploration of individual perspectives through qualitative interviews and a structured, quantitative summary of the prevalence and intensity of the identified themes across the entire sample (Krippendorff, 2018).

This mixed-methods approach was deliberately chosen to leverage the strengths of both qualitative and quantitative paradigms. A purely qualitative approach would have provided rich context but lacked a systematic way to measure the prevalence of themes across the leadership cohort. Conversely, a purely quantitative survey would have failed to capture the nuanced, context-specific insights that are critical for understanding the complex barriers to KM effectiveness. By integrating both, this study achieves a comprehensive, 'multi-layered' understanding that is both rich in detail and robust in its thematic quantification.

The research was conducted in two primary phases: a qualitative data collection and thematic analysis phase, followed by a quantitative analysis phase where the qualitative data was systematically coded and quantified.

5.1 Phase 1: Qualitative Data Collection and Thematic Analysis

5.1.1 Sampling

A purposive sampling strategy was used to recruit a representative sample of 13 senior leaders within MHC. The inclusion criteria required participants to hold a strategic leadership role with oversight of key organizational functions. This strategy ensured that all participants possessed deep contextual knowledge relevant to the research questions. Of the 18 leaders invited, 13 participated, yielding a 72% response rate.

5.1.2 Data Collection Timeline and Temporal Scope

Data were collected through semi-structured interviews. An interview protocol (see Appendix A) was developed to guide the conversations, focusing on the five dimensions of KM practice and key challenges. All interviews were audio-recorded with consent and transcribed verbatim, creating a rich textual dataset for analysis. And Data collection was conducted during the third quarter of 2023. The findings presented in this study reflect the state of knowledge practices within MHC during that specific period and do not purport to represent subsequent changes, developments, or improvements that may have occurred after the data collection period. This temporal specification is important for contextualizing the research findings and understanding them within the organizational and strategic landscape as it existed in Q3 2023.

5.1.3 Thematic Analysis

The transcribed interviews were first analyzed using Braun and Clarke's (2006) thematic analysis approach. This involved an iterative process of data familiarization, initial coding, and theme development. This initial analysis allowed for the identification of the core themes, sub-themes, and sentiment (positive, negative, neutral) expressed by the leaders regarding each aspect of KM practice.

5.2 Phase 2: Quantitative Content Analysis

5.2.1 Development of a Structured Coding Framework

To systematically quantify the qualitative findings, a structured coding framework was developed based on the themes that emerged from the thematic analysis. This framework consisted of 25 measurable items, each corresponding to a specific aspect of the five KM dimensions or a key challenge. Each item was designed to be rated on a 5-point Likert-type scale, representing the researcher's interpretation of the participant's perception (e.g., 1 = Very Negative Perception, 3 = Neutral, 5 = Very Positive Perception). This process of converting qualitative data into numerical format is known as "quantitizing." This approach, while less common, is a valid method for systematically analyzing qualitative data,

particularly when seeking to identify patterns and prevalence across a cohort (Sandelowski, Voils, & Knafl, 2009).

5.2.2 Data Coding and Quantification

In this crucial step, the researcher systematically reviewed each of the 13 interview transcripts. For every participant, the researcher acted as a trained coder, assigning a score from 1 to 5 on the coding framework for each of the 25 items. The score was determined by the overall sentiment, intensity, and specific examples provided by the participant in the interview regarding that item.

To ensure reliability, a second independent coder was trained on the framework and coded a subset of three transcripts (approximately 23% of the data). The inter-coder reliability was calculated using Cohen's Kappa, yielding a coefficient of $\kappa = 0.85$, which indicates a high level of agreement and ensures the coding process was consistent and not solely dependent on the primary researcher's subjective judgment.

5.2.3 Quantitative Data Analysis

Once all 13 transcripts were coded, the numerical data were analyzed using descriptive statistics. For each of the 25 items and for each of the five dimensions, the following metrics were calculated:

- Mean scores (to assess the average perception)
- Standard deviations (to assess variability)
- Frequency distributions (to categorize responses as Positive, Neutral, or Negative based on the Likert scale)

These quantitative summaries provided a systematic overview of the prevalence and intensity of different perceptions across the leadership cohort, complementing the rich qualitative insights from the interviews.

5.3 Researcher's Role

It is important to acknowledge that the primary researcher has a prior professional relationship with MHC as a collaborative consultant. While this relationship provided unparalleled access and a deep contextual understanding, it also introduced the potential for bias. To mitigate this, several strategies were employed. First, a semi-structured interview protocol was strictly followed to ensure consistency across all interviews. Second, the use of a second independent coder for a subset of the data helped to ensure that the thematic analysis and quantification were not solely dependent on the primary researcher's interpretations. This commitment to reflexivity was crucial for maintaining analytical distance and enhancing the trustworthiness of the findings.

6. Results

The results are presented in three main sections, corresponding to the three research questions. Each section integrates both the qualitative insights and the quantitative findings to provide a comprehensive picture of leadership perceptions:

6.1 Overview of Leadership Perceptions

Chart 1 provides a visual overview of leadership perceptions across the five dimensions of Knowledge practices at MHC. The data reveal a varied pattern ranges from negative through neutral to positive perceptions across all dimensions.

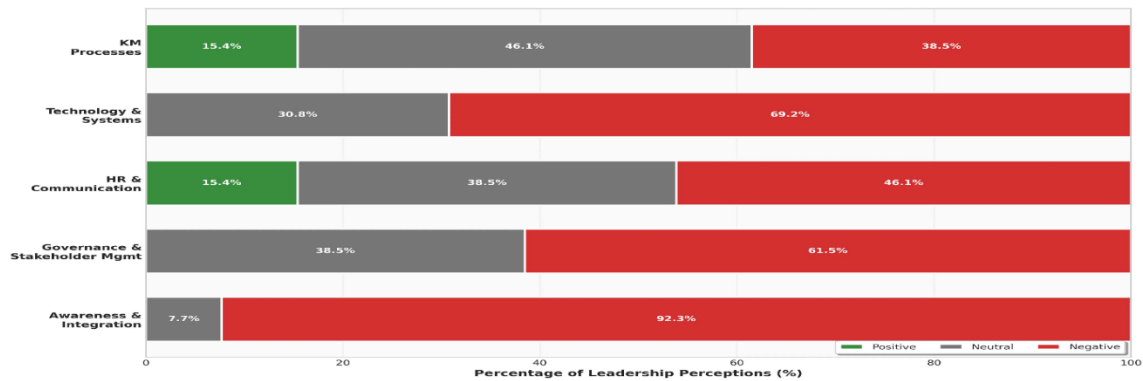


Chart 1 Leadership Perceptions Across Five KM Dimensions

This stacked bar chart shows the percentage distribution of positive, neutral, and negative perceptions for each dimension. The data reveal that negative perceptions occur more frequently than others across all dimensions, with Technology & Systems showing the most severe deficit (69.2% negative, 0% positive).

6.2 RQ1: Current State of Knowledge Practices (Five Dimensions)

6.2.1 Dimension 1: Awareness and Integration Management of KM

Leadership perceptions of KM awareness and strategic integration were negative. **92.3%** of interview transcripts were coded with a negative perception, with the remaining **7.7%** neutral.

As one leader (L7) put it, "We hear the term 'knowledge management,' but in practice, it's just a concept, not a priority. There's no clear vision for how it fits into our daily work, so it remains an abstract idea that hasn't been integrated into our departments. It feels like a missed opportunity."

This finding suggests a fundamental gap in strategic clarity. Leaders recognize the term but perceive KM as an abstract concept rather than a concrete, actionable organizational capability.

6.2.2 Dimension 2: Governance, Risk, and Stakeholder Management of KM

Governance structures for KM were perceived as weak or non-existent. **61.54%** of leaders expressed negative perceptions, while **38.46%** were neutral.

As one leader (L3) said, "We lack a formal governance structure. There are no clear policies, no accountability, and no dedicated council to oversee KM. Conceptually, we value its potential for improving patient care, but without institutional support, our efforts are fragmented and ineffective."

Despite this governance deficit, leaders did acknowledge KM's potential to enhance patient experience and service quality. **53.84%** of transcripts contained positive

remarks about KM's potential contribution to patient care, though this was framed as unrealized potential rather than current reality.

6.2.3 Dimension 3: Human Resource and Communication Management of KM

Perceptions of HR practices related to KM were mixed but predominantly negative. **46.15%** of leaders expressed negative views, **38.46%** were neutral, and only **15.39%** were positive.

As one leader (L9) explained, "We have excellent workshops. People are trained, they talk, they share ideas. But when they return to their desks, there is no formal recognition or reward for taking the extra time to document and share their expertise. The system implicitly tells them that their primary tasks are all that matters, so the knowledge often stays in the meeting room."

This dimension revealed a critical cultural barrier: the absence of incentives for knowledge-sharing behaviors, which directly undermines the Socialization and Externalization processes in the SECI model.

6.2.4 Dimension 4: Technology and Systems of KM

Technology emerged as the most problematic dimension. **69.23%** of leaders expressed negative perceptions, **30.77%** were neutral.

As one leader (L2) put it, "The situation is inconsistent. Our systems don't talk to each other. We have one system for HR, and Transformation Department with its Smart Sheet platform, and Innovation with its dedicated idea hub, have their own systems. However, these are isolated and do not connect with the rest of the cluster. Trying to get a complete picture of anything requires a massive effort. It actively discourages knowledge sharing."

The technological fragmentation was identified as a critical barrier that prevents the effective combination of explicit knowledge, a core component of the SECI spiral.

6.2.5 Dimension 5: KM Processes

Perceptions of KM processes were mixed and underdeveloped. While some aspects like knowledge storage received occasional positive mentions from a subset of leaders (approximately 38% of transcripts contained at least one positive comment about storage), the overall perception of this dimension was predominantly neutral or negative. Only **15.4%** of transcripts reflected an overall positive view of the dimension, with **46.1%** neutral and **38.5%** negative.

As one leader (L11) said, "We do have some repositories where we store documents and reports, but they're not well-organized. Finding what you need is like searching for a needle in a haystack. And when it comes to creating new knowledge or sharing lessons learned, there's no systematic process for that."

This finding indicates that while some rudimentary knowledge storage mechanisms exist, the more dynamic and strategic processes of knowledge creation, sharing, and application remain underdeveloped.

6.3 RQ2: Challenges Hindering Knowledge Management Implementation

Chart 2 presents a hierarchy of the key challenges identified by leaders, ranked by the percentage of interviews in which each challenge was mentioned as a significant barrier.

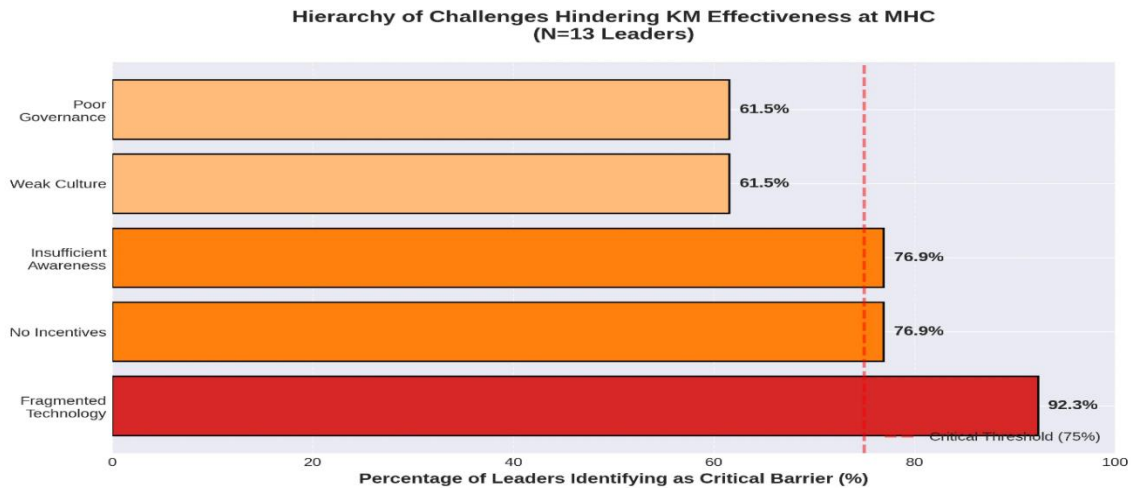


Chart 2 Hierarchy of Challenges Hindering KM Implementation

This horizontal bar chart ranks the challenges by prevalence. Fragmented and non-integrated technology infrastructure of KM was the most frequently cited barrier (92.3%), followed by lack of incentives and insufficient awareness (both 76.9%). The red dashed line indicates the 75% critical threshold, highlighting the most urgent challenges.

6.3.1 Technological Constraints

Fragmented and non-integrated technological infrastructure of KM was identified as the most significant barrier, mentioned in **92.31%** of interviews. Leaders described a landscape of disconnected systems that prevent effective knowledge combination and retrieval.

As one leader (L12) explained, "The biggest problem is that our technology. Each department has its own system, and they don't integrate. This makes it nearly impossible to share knowledge across departments or get a holistic view of our operations."

6.3.2 Organizational Barriers

Two organizational barriers were identified as critical:

- **Lack of Incentives for Knowledge Sharing:** 76.92% of leaders noted that the organization does not reward knowledge-sharing behaviors, creating a disincentive for individuals to externalize their tacit knowledge.
- **Weak Governance and Accountability:** 61.54% of the leaders think that the absence of formal governance structures means that no one is responsible for KM, leading to ad-hoc and inconsistent practices.
- **Weak Knowledge-Sharing Culture:** 61.54% of leaders described a culture where knowledge is hoarded rather than shared, undermining the Socialization process.

6.3.3 Individual Obstacles

Insufficient Organizational Awareness: 76.92% of the leaders believe that a lack of understanding about what KM is and why it matters was identified as a significant individual-level barrier. This aligns with the findings in Dimension 1 (Awareness and Integration).

6.4 RQ3: Leadership Perceptions of KM's Contribution to Organizational Performance

Leaders expressed a significant paradox, while they universally acknowledged KM's strategic potential, they perceived its current contribution to organizational performance as minimal. This disconnect is demonstrated in previous results that Leaders at MHC recognize that KM could significantly enhance patient experience, operational efficiency, and organizational learning. However, due to the absence of strategic integration, formal governance, and a unified technological platform, KM currently operates as a collection of fragmented, ad-hoc activities rather than a cohesive, value-driving capability. As a result, its actual contribution to organizational performance is perceived as negligible.

This finding directly addresses RQ3 and highlights the central tension in the study: the gap between recognized potential and realized value.

7. Discussion

7.1 Interpretation of Findings in the Context of the SECI Model

The findings reveal that the knowledge creation spiral at MHC is effectively hindered. Using the SECI framework as an analytical lens, we can identify specific points of obstruction:

- **Socialization (Tacit to Tacit):** The weak knowledge-sharing culture (61.5% of leaders identified this as a barrier) and lack of incentives (76.9%) directly undermine the informal, face-to-face interactions necessary for tacit knowledge transfer. Leaders described an environment where knowledge hoarding is inadvertently rewarded, preventing the rich, experiential knowledge from being shared across the organization.
- **Externalization (Tacit to Explicit):** The lack of formal processes and governance (61.54% negative perception) means that there are no systematic mechanisms to capture and articulate the tacit knowledge held by experienced clinicians and administrators. This represents a critical failure point, as Externalization is essential for making individual expertise accessible to the broader organization.
- **Combination (Explicit to Explicit):** The Fragmented and non-integrated technological infrastructure of KM (92.3% identified as a barrier, 69.2% negative perception) is the most severe obstruction. Without integrated systems, it is nearly impossible to combine and synthesize explicit knowledge from different sources.

- **Internalization (Explicit to Tacit):** While not explicitly measured as a separate dimension, the findings suggest that even when explicit knowledge exists (e.g., in isolated repositories), it is not effectively internalized by and lack of systematic training processes.

In essence, the five dimensions of KM practice, which should constitute a robust 'Ba' (enabling context) for the SECI spiral, are instead acting as barriers. The result is a knowledge creation process that is fragmented and unable to contribute meaningfully to organizational performance or high reliability.

7.2. Comparison with Previous Studies

7.2.1 Convergence: Technology as a Critical Factor

The finding that technological fragmentation is the most significant barrier (92.3%) strongly aligns with a consistent theme in the literature. Almuayqil et al. (2015), Alharithi (2022), and Alkinaidri (2023) all identified technology as a critical enabler or barrier to KM. This study provides quantitative validation of Alkinaidri's qualitative observation that "technological fragmentation" is a major impediment. The consistency across studies suggests that technological infrastructure of KM is a systemic issue across multiple healthcare institutions in the region, not just an isolated problem at MHC.

7.2.2 Divergence: Awareness Levels

The finding of very low KM awareness among MHC leaders (92.3% negative) presents a significant divergence from the "excellent" KM level reported by managers in Hail (Alboliteeh et al., 2023). This divergence may be explained by several factors:

- **Organizational Level and Culture:** The study by Alboliteeh et al. (2023) surveyed managers who may have a different perspective than the senior leaders in this study. It is also possible that the organizational culture and KM maturity are genuinely higher in Hail's hospitals compared to MHC.
- **Methodological Differences** The quantitative survey used by Alboliteeh et al. (2023) might capture general perceptions, while the qualitative-first approach of this study may have uncovered more critical and nuanced viewpoints from senior leaders regarding the strategic implementation of KM.
- **Contextual Factors:** The unique pressures and complexities of MHC, with its dual mandate for residents and pilgrims, may create specific challenges that are not as prevalent in other regional hospitals.

7.2.3 Validation: Governance and Incentive Gaps

The findings on weak governance (61.54% negative) and lack of incentives (76.9% identified as a barrier) directly validate and extend Alkinaidri's (2023) qualitative findings at King Abdullah Medical City. This study provides quantitative evidence that these issues are not isolated to one institution but are prevalent across MHC. The convergence of findings across multiple studies and

institutions suggests that governance and incentive structures are systemic weaknesses in the Saudi healthcare sector's approach to KM.

7.3 Theoretical Implications

This study makes two key theoretical contributions:

First, it demonstrates that the SECI model, while originally developed in a corporate context, is highly applicable to healthcare organizations, particularly those aspiring to be HRO. The explicit linkage between HRO principles (preoccupation with failure, deference to expertise, etc.) and the SECI processes (Socialization, Externalization, etc.) provides a robust theoretical foundation for understanding why KM is not just beneficial but essential in high-stakes healthcare environments.

Second, the study refines the SECI model by identifying **governance** and **technological integration** as critical prerequisites for the knowledge spiral to function. Nonaka and Takeuchi (1995) emphasized the importance of 'Ba' (enabling context) but did not specify its components in detail. This study operationalizes 'Ba' in a healthcare context, showing that without formal governance structures and integrated technological platforms, the SECI spiral cannot gain momentum. This finding suggests that future applications of the SECI model in complex organizational settings should explicitly assess these foundational enablers.

7.4. Practical Implications

For MHC leadership, the findings point to three urgent priorities:

- 1) **Establish Formal KM Governance:** Create a dedicated KM Department or committee with clear accountability, resources, and authority to develop and implement a cluster-wide KM strategy.
- 2) **Invest in Technological Integration:** Prioritize the implementation of an integrated KM platform that connects disparate systems and enables seamless knowledge combination and retrieval.
- 3) **Design Incentive Structures:** Develop performance metrics and reward systems that explicitly recognize and incentivize knowledge-sharing behaviors, shifting the organizational culture from knowledge hoarding to knowledge sharing.

These recommendations are elaborated in detail in Section 8 (Conclusion and Recommendations).

7.5. Limitations

This study has several limitations that should be acknowledged:

- **Reliance on Leadership Perceptions:** The study captures only the perspectives of senior leaders. While these perspectives are strategically important, they may not fully reflect the experiences and challenges faced by frontline staff, who are often the primary creators and users of knowledge in healthcare settings. Future

research should adopt a multi-level approach, incorporating the voices of clinicians, nurses, and administrative staff.

- **Quantitizing Qualitative Data:** While the quantitative content analysis approach was systematic and achieved high inter-coder reliability ($\kappa = 0.85$), it inherently involves a degree of researcher interpretation. The process of assigning numerical scores to qualitative sentiments, while rigorous, cannot capture the full complexity and nuance of the interview data. Readers should interpret the quantitative findings as structured summaries rather than precise measurements.
- **Cross-Sectional Design:** The study provides a snapshot of KM practices at a single point in time. It cannot capture the dynamic nature of organizational change or track improvements over time. collected during the third quarter of 2023, and does not account for any subsequent organizational changes or KM initiatives. A longitudinal study would provide richer insights into how KM practices evolve and whether interventions lead to measurable improvements.
- **Generalizability:** The findings are specific to MHC and may not be directly generalizable to other healthcare organizations in Saudi Arabia or internationally. However, the convergence with findings from multiple studies across the Saudi healthcare sector (Almuayqil et al., 2015; Bashrahil, 2017; Alharithi, 2022; Alkinaidri, 2023; Alboliteeh et al., 2023; Alsalmi, 2024) suggests that some of the identified challenges—particularly technological fragmentation, governance gaps, and lack of incentive structures—may be systemic issues rather than institution-specific problems.

8. Conclusion and Recommendations

8.1. Conclusion

This study was conceived to address a critical gap in the literature: the absence of a rigorous, leadership-centered evaluation of KM effectiveness within the complex, high-stakes environment of Saudi healthcare. While previous studies have described KM processes (Alharithi, 2022; Alkinaidri, 2023) or measured performance from a managerial perspective (Alboliteeh et al., 2023), this research provides the first in-depth, theory-driven assessment from the viewpoint of senior strategic leaders. The findings reveal a paradox: despite universal recognition of KM's strategic potential, its practical implementation at MHC is perceived as fragmented, under-resourced, and ultimately, hindered. The knowledge creation spiral, as conceptualized by Nonaka and Takeuchi's SECI model, is effectively hindered at MHC. The absence of strategic awareness, formal governance, integrated technology, and supportive incentive structures has created an environment where knowledge remains siloed, tacit expertise goes uncaptured, and the organization is unable to learn systematically from its experiences.

In the context of HRO, this represents a critical vulnerability. Healthcare clusters like MHC operate in high-stakes environments where the failure to manage knowledge can have direct consequences on patient safety and organizational resilience. Without a functioning knowledge creation spiral, MHC cannot achieve

the preoccupation with failure, deference to expertise, or commitment to resilience that characterize high-reliability systems.

However, the study also reveals a foundation for optimism: leaders are acutely aware of the problem and recognize the need for change. This awareness, combined with the actionable insights generated by this research, provides a clear roadmap for transformation.

8.2. SMART Recommendations

To address the identified gaps, this study proposes a phased, SMART (Specific, Measurable, Achievable, Relevant, Time-bound) action plan organized into three strategic priorities.

Table 1 SMART Action Plan for Transforming KM at MHC

Priority	Phase	Timeline	Specific Actions	Measurable Outcomes	Responsible Party
1- Establish KM Governance	Foundational	1-6 months	- Establish a KM Steering Committee with executive sponsorship - Develop a formal KM strategy aligned with MHC's strategic plan	- Committee established and meeting monthly - KM strategy document approved by executive leadership	Executive Leadership
	Implementation	6-12 months	- Develop KM policies and procedures - Define roles and responsibilities for KM across departments - Launch a KM awareness campaign for all staff	- KM policy manual published >50% of staff report increased KM awareness (survey)	KM Steering Committee

Priority	Phase	Timeline	Specific Actions	Measurable Outcomes	Responsible Party
2- Implement Integrated Technology Platform	Foundational	1-6 months	- Conduct a technology needs assessment - Issue RFP for an integrated KM platform - Select vendor and finalize contract	- Needs assessment report completed - Vendor selected	IT Department + KM Department
	Implementation	6-18 months	- Deploy the integrated KM platform in phases - Migrate data from legacy systems	- Platform deployed to >80% of departments >70% of staff trained	IT Department + KM Department

			• Train staff on the new platform	• >60% of legacy data migrated	
	Optimization	12-36 months	• Continuously optimize platform based on user feedback • Integrate advanced features (AI-powered search, analytics)	• User satisfaction score >4/5 • Knowledge retrieval time reduced by >50%	IT Department + KM Department
3- Design and Launch Incentive Structures	Foundational	1-6 months	• Conduct focus groups to understand motivators for knowledge sharing • Design a KM performance metric framework	• Focus groups completed • Metric framework approved	HR Department + KM Department
	Implementation	6-12 months	• Integrate KM metrics into annual performance reviews • Launch a recognition program for knowledge champions • Pilot a knowledge-sharing bonus scheme	• KM metrics included in >80% of performance reviews • >20 knowledge champions recognized in Year 1	HR Department + KM Department
	Optimization	12-36 months	• Refine incentive structures based on feedback and outcomes • Scale successful pilots cluster-wide	• >60% of staff report that incentives motivate knowledge sharing • Measurable increase in knowledge-sharing activities (e.g., contributions to repositories, participation in communities of practice)	HR Department + KM Department

8.3. Expected Impact

If implemented systematically, this action plan is expected to:

- 1) **Restart the SECI Spiral:** By addressing the foundational barriers (governance, technology, incentives), the plan will create an enabling 'Ba' that allows the knowledge creation spiral to function effectively.
- 2) **Enhance Organizational Performance:** Improved knowledge sharing and utilization will lead to better decision-making, reduced errors, increased operational efficiency, and enhanced patient outcomes.
- 3) **Build High-Reliability Capabilities:** A functioning KM system will enable MHC to develop the knowledge-intensive processes (preoccupation with

failure, deference to expertise, etc.) that are essential for high reliability in healthcare.

8.4. Future Research Directions

This study opens several avenues for future research:

- 1) **Comparative Analysis:** Replicate this study in other health clusters across Saudi Arabia to identify common patterns and region-specific challenges, contributing to a broader understanding of KM maturity and implementation across the Saudi healthcare sector.
- 2) **Multi-Level Assessment:** Conduct a parallel study that captures the perspectives of frontline staff (clinicians, nurses, administrative personnel) to provide a more comprehensive picture of KM effectiveness across all organizational levels.
- 3) **Longitudinal Evaluation:** Track the implementation of the recommended interventions over time and measure their impact on KM maturity, organizational performance, and patient outcomes.
- 4) **Instrument Development:** Develop and validate a psychometric instrument specifically designed to assess KM effectiveness in healthcare clusters, building on the coding framework used in this study.

References

- Albaladi, S. S. (2019). *Customer knowledge management in the Healthcare Sector*. Journal of Information Studies, No. 22, pp. 143-170. from <http://search.mandumah.com/Record/1084178>.
- Alboliteeh, M., Alrashidi, M. S., Alrashedi, N., Gonzales, A., Mostoles, R. J., Pasay-an, E., & Dator, W. L. (2023). *Knowledge management and sustainability performance of hospital organisations: The healthcare managers' perspective*. Sustainability, 15(1), 203. from <https://doi.org/10.3390/su15010203>.
- Alharithi, G. (2022). *A proposed model for managing customer knowledge by using smart technologies to support the experience of pilgrims* [Doctoral dissertation]. King Abdulaziz University.
- Alkainaidri, A. (2023). *The role of building knowledge mapping in building Knowledge portal: An applied study in Makkah Health Cluster* [Doctoral dissertation]. King Abdulaziz University.
- Bashrahil, H. O. (2017). *Applying knowledge management in healthcare institutions*. Journal of Information Studies, (19), 125–140. from <http://search.mandumah.com/Record/844202>.
- Braun, V., & Clarke, V. (2006). *Using thematic analysis in psychology*. *Qualitative Research in Psychology*, 3(2), 77-101, from <https://doi.org/10.1191/1478088706qp063oa>.
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). Sage Publications.
- Magdy, A., Eid, A., & Khodeir, L. (2021). Obstacles to applying knowledge management in small enterprises in the Egyptian construction sector, Review. *International Journal of Architectural Engineering and Urban Research*, 4(1), 41-66. doi: 10.21608/ijaeur.2021.215626.
- Makkah Health Cluster. (n.d.). *About us*. Retrieved December 16, 2025. from <https://www.makkahhc.sa>.
- Almuayqil, S., Atkins, A., & Sharp, B. (2015). *Knowledge management framework for e-healthcare in Saudi Arabia*. In Proceedings of the Seventh International Conference on eHealth, Telemedicine, and Social Medicine (Etelemed), Lisbon Portugal. ISBN: 978-1-61208-384-1
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press.
- Alsalmi, A. F. (2024). *The role of knowledge processes in developing health services*. Arab Journal of Scientific Publishing, (69), 22–47. from <http://search.mandumah.com/Record/1547356>.
- Sandelowski, M., Voils, C. I., & Knafl, G. (2009). *On Quantitizing*. Journal of mixed methods research, 3(3), 208–222. from <https://doi.org/10.1177/1558689809334210>.
- Weick, K. E., & Sutcliffe, K. M. (2015). *Managing the unexpected: Sustained performance in a complex world* (3rd ed.). John Wiley & Sons.

Appendix A: Semi-Structured Interview Protocol

Thank you for agreeing to participate in this study. The purpose of this interview is to understand your perspectives on knowledge management practices at MHC. There are no right or wrong answers - I'm interested in your honest views and experiences. The interview will take approximately 45-60 minutes, and all responses will be kept confidential.

Section 1: Awareness and Integration Management of KM

- 1) How familiar are you with the concept of knowledge management?
- 2) To what extent is knowledge management integrated into MHC's strategic planning?
- 3) Can you describe any formal knowledge management initiatives currently in place at MHC?

Section 2: Governance, Risk, and Stakeholder Management of KM

- 4) Who is responsible for knowledge management at MHC?
- 5) Are there formal governance structures (e.g., committees, policies) for knowledge management?
- 6) How does MHC manage risks related to knowledge loss (e.g., staff turnover)?
- 7) In your view, how does knowledge management contribute to patient experience and service quality?

Section 3: Human Resource and Communication Management of KM

- 8) How does MHC encourage knowledge sharing among staff?
- 9) Are there incentives or recognition programs for employees who share their knowledge?
- 10) How effective are the current communication channels for sharing knowledge across departments?

Section 4: Technology and Systems of KM

- 11) What technological tools or systems does MHC use to manage knowledge?
- 12) How well do these systems integrate with each other?
- 13) What are the main technological challenges you face in managing knowledge?

Section 5: Knowledge Management Processes

- 14) Can you describe how knowledge is created, captured, stored, shared, and applied at MHC?
- 15) Are there systematic processes for documenting lessons learned or best practices?

Section 6: Challenges

- 16) What do you see as the biggest barriers to effective knowledge management at MHC?
- 17) Are there individual, organizational, or technological obstacles that hinder knowledge sharing?

Closing

18) Is there anything else you would like to add about knowledge management at MHC?

Your perspectives are invaluable to this research.
Thank you very much for your time and insights.

Appendix B: Quantitative Survey Instrument (Coding Framework)

This framework was used by the researcher to systematically code the qualitative interview data. Each item was rated on a 5-point Likert scale based on the sentiment and intensity expressed in the interview transcript.

Scale:

- 1 = Very Negative Perception
- 2 = Negative Perception
- 3 = Neutral Perception
- 4 = Positive Perception
- 5 = Very Positive Perception

Dimension 1: Awareness and Integration Management of KM

- 1) Overall awareness of KM concepts
- 2) Integration of KM into strategic planning
- 3) Existence of formal KM initiatives

Dimension 2: Governance, Risk, and Stakeholder Management of KM

- 4) Clarity of KM responsibilities
- 5) Existence of formal governance structures
- 6) Effectiveness of risk management related to knowledge loss
- 7) Perceived contribution of KM to patient experience

Dimension 3: Human Resource and Communication Management of KM

- 8) Encouragement of knowledge-sharing behaviors
- 9) Existence of incentives for knowledge sharing
- 10) Effectiveness of communication channels

Dimension 4: Technology and Systems of KM

- 11) Availability of KM technological tools
- 12) Integration of technological systems
- 13) Overall satisfaction with technological infrastructure

Dimension 5: Knowledge Management Processes

- 14) Effectiveness of knowledge creation processes
- 15) Effectiveness of knowledge capture processes
- 16) Effectiveness of knowledge storage processes
- 17) Effectiveness of knowledge sharing processes
- 18) Effectiveness of knowledge application processes

Challenges

- 19) Individual obstacles (e.g., lack of awareness, resistance to change)
- 20) Organizational barriers (e.g., weak governance, lack of incentives, poor culture)
- 21) Technological constraints (e.g., fragmented systems, lack of integration).