



The Mediating Role of Knowledge Management in the Impact of Training on Quality of Health Services

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ABSTRACT

This study aims to examine the mediating role of knowledge management (KM) in the effect of training on the quality of health services (QHS) in private hospitals in Sana'a, Yemen. A quantitative approach was employed using a questionnaire designed to collect data from healthcare staff (doctors, nurses, and other healthcare professions such as laboratory technicians, pharmacists, anesthetists). Participants were selected using a stratified random sampling method. A total of 327 questionnaires were retrieved, 19 were excluded for being incomplete, and 307 were subjected to statistical analysis using SPSS and SmartPLS. The results revealed that the "training needs assessment" dimension was the least important among the training dimensions from the perspective of the study sample. Consequently, it had no positive impact on QHS, and its effect on knowledge management was weak and statistically insignificant. However, when training was measured in its combined dimensions, it was found to have a positive effect on the quality of health services. The study also revealed a positive relationship between KM and QHS. As for the mediating role of KM with its combined dimensions, it played a partial mediating role, with the most significant dimensions in this relationship being storage, generation, and application, whereas the "Knowledge Sharing" dimension was not statistically significant. Practical Implications: In light of this, organizations should pay greater attention to the stage of training needs assessment, as neglecting it could reduce the effectiveness of training.

Keywords: Training, Knowledge Management, Quality of Health Services, Private Hospitals, Yemen

JEL Classifications: I10, I19, M53, O15, M10

1. INTRODUCTION

The quality of health services (QHS) emerges as one of the most important indicators reflecting the efficiency of the healthcare system, its ability to provide comprehensive services that adhere to professional and ethical standards, meet the needs of beneficiaries, and achieve their satisfaction, thereby contributing to enhancing community health and improving the quality of life. Accordingly, many hospitals and healthcare institutions have come to recognize the strategic importance of implementing health service quality and take it seriously (Al-Malkawi, 2021). In light of rapid changes and developments, especially in the health sector, pressures on healthcare institutions to provide services that meet the growing and changing needs of beneficiaries are increasing.

Therefore, it has become essential for healthcare institutions to focus on developing the capabilities and competencies of their staff through continuous training programs that help improve efficiency and performance (Santoso et al., 2018; Wang et al., 2024). Training contributes to enhancing technical and managerial skills and is directly linked to employees' ability to acquire the necessary skills and knowledge to provide high-quality healthcare services (Alharbi and Aloyuni, 2023; Shahnazi et al., 2021). On the other hand, the relationship between training and knowledge management (KM) is considered a positive one, as training is one of the main drivers for developing KM. It helps provide a supportive environment for generating and sharing knowledge among employees. A trained employee transfers what they have learned to their colleagues, which enhances the processes of

creating, storing, sharing, and utilizing knowledge within the organization (Warren et al., 2024).

Meanwhile, KM represents an important framework for enabling healthcare institutions to transform individual experiences into organizational knowledge that contributes to improving decision-making, enhancing performance, and elevating the overall QHS (Hujala and Laihonon, 2021; Musharraf and Sawadi, 2023). Undoubtedly, activating KM in hospitals can contribute to improving QHS by enabling staff to benefit from previous experiences, exchange critical information quickly and accurately, and support evidence-based decision-making, thereby helping to provide more efficient and higher-quality healthcare services to beneficiaries (Hilger and Wahl, 2022).

From this perspective, it is clear that KM practices play an important role in enhancing the efficiency of health sectors; they are not limited to generating, storing, disseminating, and applying knowledge, but also contribute to achieving beneficiary satisfaction and improving the overall performance of healthcare institutions (Faraji-Khiavi et al., 2015; Afriyanti et al., 2025; Johan et al., 2018). Furthermore, these practices help improve the quality of decision-making, enhance responsiveness, and ensure the continuity of organizational learning within the organization (Hujala and Laihonon, 2021). From this standpoint, numerous studies emphasize the importance of integrating KM with total quality strategies in the health sector, due to its positive impact on increasing the efficiency of the health system and ensuring the sustainability of institutional performance (Taheri and Gharakhani, 2013; Mosadeghrad, 2014).

In terms of QHS in a developing country like Yemen, despite the developments witnessed in the health sector in recent years, including the increase in the number of private health facilities and the development of some therapeutic services, private hospitals still face significant difficulties in achieving beneficiary satisfaction with QHS (Zabiba and Abbas, 2020). The health sector in Yemen faces numerous challenges that affect the provision of quality health services. Among the most prominent of these challenges are the limited specialized health centers and their lack of necessary equipment, as well as the suboptimal use of technology (Al-Adeeb, 2018). There are also significant administrative, professional, and economic obstacles (Alarafy and Alkohaly, 2024), in addition to the weak efficiency of some training stages, including the decline in the level of training needs assessment in Yemeni hospitals (Salah, 2018).

This led many beneficiaries to avoid receiving health services in local hospitals, and some of them were forced to travel abroad to obtain higher-quality health services, which caused tangible economic losses to the state (Republic of Yemen, Ministry of Public Health and Population, 2010). Statistics indicate that their number reached about 280,000 travelers annually (Shuja' al-Din, 2013).

Many organizations and bodies have begun to recognize the importance of continuous education and training to enhance QHS in Yemen. One of the most notable initiatives is the Health System Strengthening Project, implemented by the Yemeni-German

Doctors' Association with the German Agency for International Cooperation, which focuses on improving the efficiency of staff and enhancing the quality of services provided to beneficiaries (German-Yemeni Association of Physicians DJÄV, 2025).

From the foregoing, and despite the numerous studies that have addressed the impact of training on QHS, or the relationship between KM and QHS, there is still a scarcity of studies that have examined the integrative relationship among the three variables (training, KM, QHS) – to the best of the researcher's knowledge – which represents the research gap of this study that seeks to understand the nature of these relationships.

2. THEORETICAL FRAMEWORK

2.1. Training

Training is considered one of the most important effective means that can enhance the knowledge and skills of trainees, improve their practices, increase their confidence in their abilities, and bring about positive changes in their attitudes. However, its effects depend on the institution's ability to provide training opportunities for everyone, careful planning, and allocating sufficient resources to ensure comprehensive access to training (Thor et al., 2016). Several studies have pointed to the positive relationship between training and the improvement of healthcare service quality. For instance, Salah (2018) demonstrated a positive direct relationship between training and QHS. Studies by Al-Maimouni and Al-Mutairi (2021), Al-Sadiq (2019), and Mousa (2019) also indicated that good training directly affects the efficiency of employees, contributing to the improvement of healthcare service quality. Furthermore, Al-Asadi and Al-Sarn (2017) confirmed a positive relationship between training and healthcare service quality in its various dimensions, while Nangombe (2015) emphasized the importance of designing effective training programs to improve and enhance the healthcare services provided by health sectors to beneficiaries.

While training programs contribute to improving hospital managers' abilities in strategic and operational planning, change management, and developing their behavioral and leadership skills, this reflects the importance of investing in the design of comprehensive training programs aimed at developing the technical, professional, and managerial skills of healthcare leaders to ensure improved institutional performance and QHS (Ravaghi et al., 2021). Training also helps new employees acquire the necessary skills to effectively carry out their assigned tasks, and assists current or active employees in continuously developing their professional skills and capabilities. The process of training needs assessment, developing training programs, and implementing them is considered a vital task that ensures the organization's ability to respond to performance requirements and achieve its strategic goals.

2.2. Quality of Health Services (QHS)

Quality in health services is not limited to technical efficiency in service delivery; it also includes dimensions that help build trust between beneficiaries and service providers. In this context, the current study aimed to measure QHS through

five dimensions; these dimensions represent the SERVQUAL model. The study by Rahmatia et al. (2025) indicates that the SERVQUAL model is an effective tool for evaluating QHS. The reliability dimension can measure the ability of the institution and its staff to deliver services accurately and without errors, with attention to details and fulfilling promises to beneficiaries, reflecting the level of dependability in performance (Amporfro et al., 2021). Reliability is also associated with building trust and client satisfaction, especially in the healthcare sector (Kitapci et al, 2014). As for the dimension of Assurance, it allows for measuring and evaluating the knowledge and behaviors that employees possess, enabling them to provide high-quality services, so that beneficiaries feel respected and confident (Goula et al, 2021). Assurance includes effective communication skills, courtesy, and competence, along with the ability to instill trust and reassurance in beneficiaries while receiving the service (Mmutle and Shonhe, 2017). As for the dimension of Empathy, it measures the employees' ability to provide individualized services to beneficiaries and pay attention to their needs while receiving the service, reflecting the concern to understand each person's specific requirements and provide appropriate support (Rana et al., 2019). The empathy dimension shows the effort that employees exert to understand the beneficiaries and offer options that suit them (Katuti et al., 2018). As for the tangibles dimension, it relates to the physical aspects of the service, including equipment, materials, and sanitary facilities, which contribute to improving the beneficiaries' experience (Peprah and Atarah, 2014). Finally, the responsiveness dimension measures the readiness of staff to provide service quickly and efficiently, as well as their willingness to help beneficiaries when needed, reflecting the hospital's ability to meet customers' needs promptly and effectively (Azmi et al., 2017).

2.3. Knowledge Management (KM)

KM is a modern concept that has gained increasing importance over the past two decades as one of the most crucial factors influencing business sustainability and enhancing performance. It is an organized process aimed at creating, storing, organizing, transferring, and applying knowledge in a way that ensures optimal use of it in decision-making and performance improvement (Weed-Schertzer, 2020).

Moreover, KM is a rational practice that includes a series of stages to produce a final knowledge product (Weed-Schertzer, 2020). It involves people, processes, content, culture, and the technologies necessary to capture, find, manage, and share information (Hilger and Wahl, 2022).

KM processes in hospitals, including the creation, storage, sharing, and application of knowledge, are influenced by many organizational factors such as organizational structure, leadership, institutional learning, information technology systems, trust, and collaboration. This highlights the importance of developing management strategies that foster a supportive work environment for KM and its effective application to improve organizational performance and QHS (Lee, 2017). While the application of KM practices would play a prominent role in enhancing the efficiency of healthcare organizations and achieving the satisfaction of their

beneficiaries (Afriyanti et al., 2025; Johan et al., 2018), several studies have found that the effectiveness of KM contributes to improving decision-making, rapid response, and ensuring the continuity of organizational learning (Hujala and Laihonon, 2021). Some studies have also pointed to the importance of integrating the concepts of KM and total quality in the healthcare sector to improve the efficiency of the healthcare system and the sustainability of performance (Taheri and Gharakhani, 2013; Mosadeghrad, 2014).

2.4. Study Hypotheses

The current study aims to verify the validity of the following hypotheses:

- H_1 : There is a statistically significant effect of training on QHS
- H_2 : There is a statistically significant effect of training on KM
- H_3 : There is a statistically significant effect of KM on QHS
- H_4 : There is a statistically significant effect of training on QHS through the mediating role of KM.

3. METHODOLOGY

3.1. Research Design

The current study adopted a quantitative research design using the survey questionnaire method within the framework of the descriptive-analytical approach. This design aims to collect precise quantitative data and analyze it statistically to test the proposed structural equation model (SEM) and validate the research hypotheses.

3.2. Study Sample

The study sample was selected from the original population using stratified random sampling to ensure representation of all occupational categories (doctors, nurses, and other health professions such as laboratory technician, radiology technician, anesthesia technician, pharmacy technician). The sample size was determined according to the Krejcie and Morgan formula at a 95% confidence level and a 5% margin of error, with the total targeted population being 326 individuals. The sample was proportionally distributed according to the size of each stratum in the original population (Table 1).

3.3. Data Collection Instrument

The study relied on the self-report questionnaire as the main tool, based on standardized scales in previous literature and adapted to the local context. The questionnaire consisted of four sections:

1. Demographic Data: gender, age, educational qualification, years of experience, and job specialization
2. Training Scale: measures the Training Management Cycle through four dimensions: Training Needs Assessment, Training Planning, Training Implementation, and Training Evaluation
3. KM Scale: measures KM Processes through: Knowledge Creation, Knowledge Storage, Knowledge Sharing/Transfer, and Knowledge Application
4. QHS Scale: Measures employees' perception of quality through the modified SERVQUAL model for the healthcare sector with five dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy.

Table 1: Sample distribution by hospital

No.	Hospital	Sample size (Frequency)	Percentage	Cumulative percentage
1	International Arab Hospital	14	4.3	4.3
2	Modern European Hospital	29	8.9	13.2
3	Modern German Hospital	30	9.2	22.4
4	Azal Hospital	62	19.0	41.4
5	Dr. Abdulkader Almutawakel Hospital	46	14.1	55.5
6	University of Science and Technology Hospital	145	44.5	100.0
	Total	326	100.0	—

Source: Prepared by the authors based on human resources information in hospitals and actual participant responses

A 7-point Likert scale was used, where responses range from (1 = Strongly Disagree) to (7 = Strongly Agree).

3.4. Data Analysis

The study data were analyzed using the SPSS, version 28, along with SmartPLS, version 4.08.6, to assess reliability, convergent validity, and to test the study hypotheses, following the guidelines of Hair et al. (2019). Prior to conducting structural equation modeling (SEM), the fundamental assumptions of the statistical models were carefully verified to ensure the accuracy and validity of the results, in line with the recommendations of Xiong et al. (2025) regarding the importance of meeting the requirements of SEM. The assumption-checking procedures included the following:

- **Missing Data:** The dataset was examined for any missing values, and none were identified, which strengthens the robustness of the analysis and reduces the risk of biased results
- **Outliers:** The SPSS Explorer function was used to detect outliers within the study variables. The analysis indicated that no outliers were present that could affect the structural modeling
- **Normality:** The normality of the variables was evaluated using skewness and kurtosis indices. All variables fell within acceptable ranges, indicating that the data approximately followed a normal distribution
- **Normality:** The distribution of variables was assessed using skewness and kurtosis. All variables demonstrated absolute skewness values between -1.213 and -1.061 and kurtosis values ranging from 1.077 to 1.478 , which are well within the recommended thresholds for SEM analysis ($\text{skewness} < \pm 3$, $\text{kurtosis} < \pm 10$). These results indicate that the data approximated a normal distribution, supporting the appropriateness of the analytical methods used. The descriptive statistics for normality are presented in Table 2.

3.4.1. Common method bias

To assess the potential presence of common method bias, Harman's single-factor test was performed. The results revealed that the first factor accounted for $< 50\%$ of the total variance, suggesting that common method bias does not pose a significant threat to the validity of the findings.

Content validity: The questionnaire was presented to a panel of 15 experts to assess the appropriateness of the items, clarity of wording, and comprehensiveness. Based on their feedback, 4 items were deleted, 2 items were added, and the wording of 15 items was modified.

Construct validity: It was verified through Confirmatory Factor

Table 2: Descriptive statistics and normality assessment

Variable	N	Skewness		Kurtosis	
		Statistic	Standard error	Statistic	Standard error
Training	307	-1.061	0.139	1.077	0.277
QHS	307	-1.164	0.139	1.273	0.277
KM	307	-1.213	0.139	1.478	0.277

Source: Prepared by the authors based on statistical analysis results

Analysis (CFA) using SmartPLS, and the results showed good convergent validity with high factor loadings and an AVE > 0.50 for all constructs.

3.5. Reliability

Internal consistency was measured using Cronbach's Alpha and Composite Reliability (CR), where all values exceeded the minimum acceptable threshold of 0.70, indicating a high reliability of the instrument (Table 3).

4. RESULTS

4.1. Demographic Characteristics of the Study Sample

As shown in Table 4, the sample was predominantly male (55.7%), with nurses representing the largest professional group (53.7%). The majority of respondents were aged 20-30 years (49.8%) and held a Bachelor's degree (41.4%).

4.2. Descriptive Analysis of Study Variables

4.2.1 Training

Table 5 shows that the overall average level of training was (5.397), a high score (77.1%). Regarding the dimensions of training, the training planning dimension received the highest relative importance (77.8%), followed by the training evaluation dimension (77.7%). This can be explained by the fact that the hospitals under study pay significant attention to organizing the training process and monitoring its impact. The dimension of training needs assessment came in last place (76.2%).

4.2.2. Quality of health services

Table 6 shows that the overall average for QHS was (5.891) with a significance level of (84.2%), indicating that the sample group perceived a high level of quality in the health services at the surveyed hospitals. The results also show that the tangible dimension ranked first with an average of (6.085) and a relative significance of (86.9%), demonstrating the surveyed hospitals' commitment to providing a suitable physical environment and modern equipment that reflects a positive image among staff and patients. This was followed by the reliability dimension at (85.8%), reflecting the

hospitals' ability to deliver services accurately and efficiently. In contrast, the responsiveness dimension ranked last at (81.0%), which may indicate the hospitals' need to improve the speed of responding to patients' needs and enhance communication channels with them.

4.2.3. KM practices

Table 7 indicates that the overall average level of KM practices in the surveyed hospitals was (5.704), representing (81.5%), indicating a high level of KM practices. It is also evident that the storage dimension ranked first with an average of (5.741) and a percentage of (82.0%), demonstrating the hospitals' commitment to documenting and preserving knowledge for future use. The application dimension came in second with an average of (5.724) and a percentage of (81.8%), followed by the generation

dimension with an average of (5.696) and a percentage of (81.4%). The sharing dimension ranked relatively last with an average of (5.653) and a percentage of (80.8%), although it was at a high level, suggesting the potential for enhancing knowledge sharing practices among staff within Yemeni private hospitals.

4.3. Testing Hypotheses

4.3.1. Testing H_1 : Effect of training on QHS

The data in Table 8 and Figure 1 show that overall training has a strong and positive effect on QHS ($\beta = 0.621$, $P < 0.001$). This result indicates that training, in its dimensions collectively, contributes effectively to QHS provided to beneficiaries.

To examine this result in more detail, the effect of each dimension of training was tested individually, and it was found that planning, implementation, and evaluation each had a positive effect on QHS, while the dimension of "training needs assessment" showed a negative and statistically significant effect, which indicates a deficiency in the process of training needs assessment in the private hospitals included in the study.

4.3.2. Testing H_2 : Effect of training on KM

The results presented in the Table 9 indicate that overall training has a strong and positive effect on KM ($\beta = 0.584$, $P < 0.001$), suggesting that improving training contributes to enhancing KM practices.

When examining the individual training dimensions, the results show that planning, implementation, and evaluation each had a positive effect on KM to varying degrees, while the dimension of training needs assessment did not show any statistically significant

Table 3: Reliability of the study instrument

Variable	Dimension	Cronbach's Alpha	(CR)	(AVE)
Training	Training needs assessment	0.908	0.910	0.686
	Training planning	0.940	0.941	0.771
	Training implementation	0.934	0.936	0.754
	Training evaluation	0.932	0.934	0.747
KM	Knowledge creation	0.932	0.934	0.748
	Knowledge storage	0.885	0.886	0.636
	Knowledge sharing	0.947	0.950	0.792
	Knowledge application	0.947	0.948	0.792
QHS	Responsiveness	0.917	0.924	0.706
	Reliability	0.910	0.911	0.691
	Tangibles	0.908	0.909	0.687
	Assurance	0.950	0.950	0.799
	Empathy	0.943	0.946	0.779

Source: Prepared by the authors based on the statistical analysis results

Table 4: Demographic characteristics of the study sample

Demographic characteristics	Frequency	Percentage
Sex		
Male	171	55.70
Female	136	44.30
Age		
20-30	153	49.80
31-40	119	38.80
41-50	29	9.40
Above 50	6	2.00
Educational level		
Diploma	108	35.20
Bachelor's	127	41.40
Postgraduate	28	9.10
Master's	28	9.10
Doctorate	16	5.20
Years of experience		
1-5 years	120	39.10
6-10 years	91	29.60
11-15 years	68	22.10
16-20 years	22	7.20
More than 20 years	6	2.00
Job Title		
Physician	56	18.20
Nurse	165	53.70
Laboratory technician	38	12.40
Radiology technician	18	5.90
Anesthesia technician	16	5.20
Pharmacy technician	14	4.60

Source: Prepared by the authors based on statistical analysis results

Table 5: Descriptive statistics of training dimensions

Variable	Mean	Standard deviation	Percentage
Training planning	5.448	1.215	77.8
Training evaluation	5.442	1.217	77.7
Training implementation	5.367	1.324	76.7
Training needs assessment	5.332	1.288	76.2
Overall training	5.397	1.084	77.1

Source: Prepared by the authors based on statistical analysis results

Table 6: Descriptive statistics of QHS dimensions

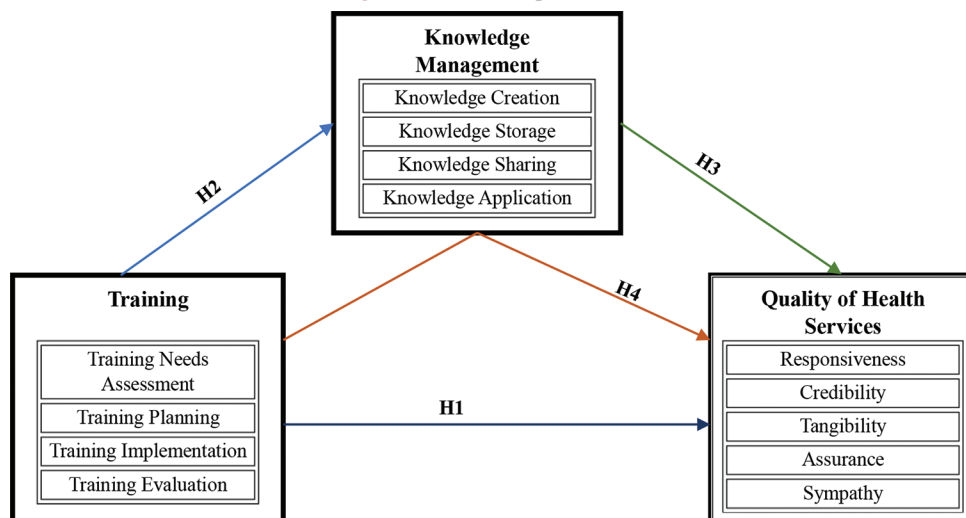
Variable	Mean	Standard deviation	Percentage
Tangibles	6.085	0.975	86.9
Reliability	6.009	0.923	85.8
Assurance	5.9	1.111	84.3
Empathy	5.791	1.149	82.7
Responsiveness	5.669	1.141	81
Overall QHS	5.891	0.86	84.2

Source: Prepared by the authors based on statistical analysis results

Table 7: Descriptive statistics of KM practices

Variable	Mean	Standard deviation	Percentage
Knowledge storage	5.741	1.131	82
Knowledge application	5.724	1.104	81.8
Knowledge generation	5.696	1.131	81.4
Knowledge sharing	5.653	1.231	80.8
Overall KM	5.704	1.007	81.5

Source: Prepared by the authors based on statistical analysis results

Figure 1: The conceptual model

Table 8: Effect of Training on QHS

Path	Beta	Standard error	t	Significance
Overall Training->QHS	0.621	0.036	17.105	0
Training Needs Assessment->QHS	-0.261	0.063	4.123	0
Training Planning->QHS	0.256	0.076	3.36	0.001
Training Evaluation->QHS	0.397	0.096	4.141	0
Training Implementation->QHS	0.24	0.109	2.204	0.028

Source: Prepared by the authors based on statistical analysis results

Table 9: Effect of training on KM

Path	Beta	Standard error	t	Significance
Overall training->KM	0.584	0.055	10.634	0
Training needs assessment->KM	-0.047	0.076	0.618	0.268
Training planning->KM	0.144	0.078	1.847	0.032
Training implementation->KM	0.175	0.089	1.96	0.025
Training evaluation->KM	0.373	0.077	4.835	0

Source: Prepared by the authors based on statistical analysis results

Table 10: Effect of KM on QHS

Path	Beta	Standard error	t	Significance
Overall KM->QHS	0.493	0.053	9.321	0
Knowledge generation->QHS	0.241	0.107	2.265	0.012
Knowledge storage->QHS	0.264	0.1	2.631	0.004
Knowledge sharing->QHS	0.147	0.114	1.293	0.098
Knowledge application->QHS	0.135	0.075	1.81	0.035

Source: Prepared by the authors based on statistical analysis results

effect, reinforcing the idea that weak TNA could limit the efficiency of KM in the private hospitals included in the study.

4.3.3. Testing H_3 : Effect of KM on QHS

The results presented Table 10 and Figure 2 indicate that overall KM has a positive and strong effect on QHS ($\beta = 0.493$, $P < 0.001$), indicating that promoting KM practices effectively contributes to improving the quality of services provided to beneficiaries.

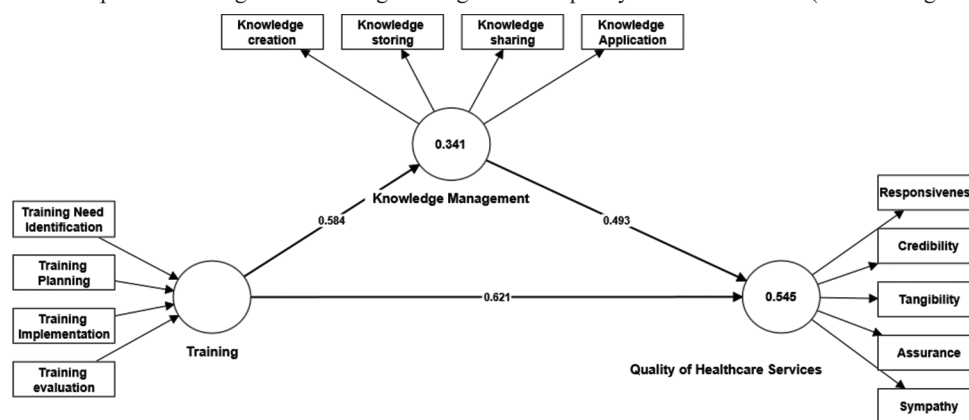
When analyzing the effect of the dimensions of KM individually, the results show that generation, storage, and application each had a positive and statistically significant effect on QHS. As for knowledge sharing, it showed a positive effect but was not statistically significant ($\beta = 0.147$, $P = 0.098$), indicating that this

dimension may be underutilized or less effectively implemented in the studied hospitals.

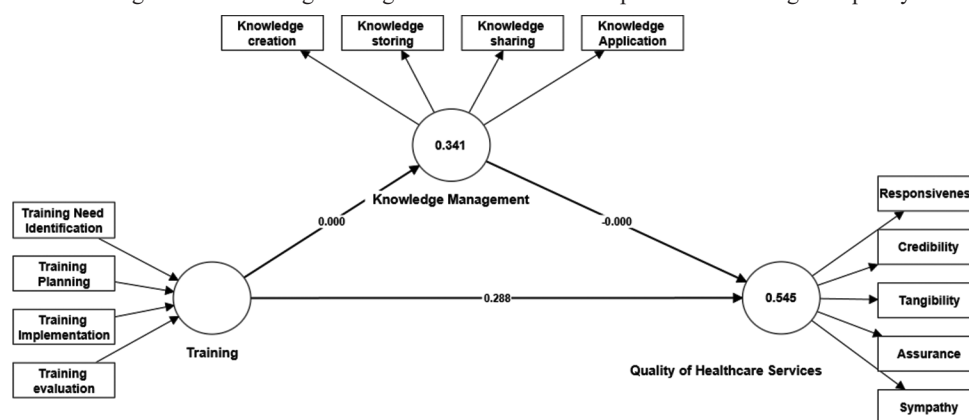
4.3.4. Testing H_4 : Effect of KM on QHS through KM

The results of the path analysis in Table 11 and Figure 3 showed that training has a positive and strong effect on QHS through overall KM ($\beta = 0.288$, $t = 8.064$, $P < 0.001$), indicating that enhancing training practices effectively contributes to improving KM and, consequently, improving QHS.

When examining the effect of the individual dimensions of KM as mediating paths, it was found that knowledge storage, knowledge generation, and knowledge application each had a positive effect on QHS, reflecting the importance of these

Figure 2: The impact of training and knowledge management on quality of health services (standard regression path)

Source: Prepared by the authors based on statistical analysis results

Figure 3: The mediating role of knowledge management in the relationship between training and quality of health services

Source: Prepared by the authors based on statistical analysis results

Table 11: Path coefficients of training on QHS through KM

Path	Beta	Standard error	t	Significance
Training->Overall KM->QHS	0.288	0.036	8.064	0
Training->Knowledge Storage->QHS	0.13	0.056	2.324	0.01
Training->Knowledge Sharing->QHS	0.089	0.068	1.301	0.097
Training->Knowledge Generation->QHS	0.109	0.055	1.99	0.023
Training->Knowledge Application->QHS	0.072	0.043	1.678	0.047

Source: Prepared by the authors based on statistical analysis results

dimensions in strengthening this relationship. As for knowledge sharing, it showed a positive effect but was not statistically significant ($\beta = 0.089$, $t = 1.301$, $P = 0.097$), which may indicate that there are challenges in knowledge exchange or a weak utilization of this dimension in the private hospitals included in this study.

5. DISCUSSION

The study results showed that the “training needs assessment” dimension was the least important among the training dimensions, indicating that Yemeni private hospitals prioritize all stages of training over training needs assessment. This finding aligns with Salah’s (2018) study, which demonstrated a weakness in identifying the training needs of healthcare workers. This suggests that hospitals conduct training programs as mere formalities or

routine procedures, but these programs fail to address the skill and knowledge gaps of healthcare workers. This results in a waste of resources without any tangible improvement in staff performance or service quality (Thor et al., 2016).

In light of this, the statistical analysis of the study confirmed that the “training needs assessment” dimension had no positive impact on QHS ($\beta = -0.261$, $t = 4.123$, $P < 0.05$), and its impact on KM was weak and not statistically significant ($\beta = -0.047$, $t = 0.618$, $P > 0.05$).

The study results revealed that training, in its entirety, had a positive impact on QHS ($\beta = 0.621$, $t = 17.105$, $P < 0.05$). This finding aligns with those of Salah (2018), Al-Maimouni and Al-Mutairi (2021), Al-Sadiq (2019), Mousa (2019), and Al-Asadi and Al-Sarn (2017), all of whom concluded that effective training contributes to improving employee skills and service quality.

Similarly, the study results also revealed a positive impact of training, in all its dimensions except for the dimension of training needs assessment, on KM ($\beta = 0.584$, $t = 10.634$, $P < 0.05$). This indicates that training is not limited to developing employee skills but extends its influence to enhancing KM practices. Therefore, it can be noted that training represents one of the main channels that can support KM practices. This result is similar to the studies of Gao et al. (2020) and Nangombe (2015), which indicated that training is one of the enabling factors for KM, by creating a continuous learning environment that would support knowledge sharing and application to improve organizational performance.

The study also found a positive correlation between KM practices and QHS ($\beta = 0.493$, $t = 9.321$, $P < 0.05$). This indicates that hospitals adopting KM practices are more likely to achieve higher quality healthcare services. This finding aligns with the research of Khalifa (2023), Al-Safi (2019), and Pereira de Souza et al. (2020), which concluded that KM is a crucial pillar for achieving institutional excellence and sustainable quality. Therefore, KM is not merely an administrative activity, but rather an integrated framework for improving the efficiency of healthcare operations. It helps hospitals transform individual knowledge into organizational knowledge, contributing to improved healthcare and administrative decisions.

Regarding the mediating role of KM in the relationship between training and QHS, the study results indicated that KM practices, in their combined dimensions, play a mediating but partial role in this relationship ($\beta = 0.288$, $t = 8.064$, $P < 0.05$). The relationship was statistically significant across the dimensions of knowledge storage, knowledge generation, and knowledge application, but not statistically significant across the dimensions of knowledge dissemination. Studies by Warren et al. (2024), Hujala and Laihonon (2021), and Musharraf and Sawadi (2023) have confirmed the important mediating role of KM in enhancing the impact of training on operational and organizational performance.

6. CONCLUSION

This study investigated the mediating role of KM in the relationship between training and QHS in private hospitals in Sana'a, Yemen. The findings confirmed that training, in its integrated dimensions, has a significant positive impact on both KM and QHS. Furthermore, KM was found to partially mediate this relationship, with knowledge storage, generation, and application being the most influential dimensions. However, the study revealed a critical weakness in the "training needs assessment" stage, which showed no significant impact on either KM or service quality, indicating that this foundational step is often overlooked in practice.

The novelty of this study lies in its integrative approach, examining the three variables (training, KM, and QHS) within a single conceptual model in the under-researched context of Yemen's private healthcare sector. Practically, the findings underscore the urgent need for hospitals to adopt systematic, evidence-based mechanisms for assessing training needs, ensuring that training programs address actual skill and knowledge gaps. Additionally, hospitals should invest in creating knowledge databases and fostering a culture of knowledge sharing and application to

maximize the benefits of training on service quality.

This study has some limitations, including its focus on private hospitals in one city (Sana'a), which may limit the generalizability of the findings. Future research could expand the scope to include public hospitals and other governorates in Yemen. Comparative studies examining the effectiveness of different training needs assessment models would also be valuable. Furthermore, qualitative research could provide deeper insights into the barriers to effective knowledge sharing among healthcare professionals.

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