SEBHA UNIVERSITY JOURNAL OF PURE & APPLIED SCIENCES VOL.24 NO.1 2025
DOI: 10.51984/JOPAS.V24I1.3728

مجلة جامعة سبها للعلوم البحتة والتطبيقية
Sebha University Journal of Pure & Applied Sciences

Journal homepage: www.sebhau.edu.ly/journal/jopas

The Impact of E-Management on the Quality of Health Services: A Field Study at Sabha Medical Centre

Jabar Mansour*, Khaled Shabl, Moammar Mashmoor, Ahmed Al-Saadi and Hassan Mashmoor

Department of Busoness Administration, Faculty of Commerce nad Political Science, Sebha University, Sebha, Libya.

Keywords:
E-Governance.
Healthcare.
Human Resources (HR).
Technical Infrastructure.
Healthcare Quality.

ABSTRACT

This study explores the role of e-management in enhancing the quality of healthcare services at Sabha Medical Centre, focusing on its reliance on human, technical, and administrative elements, as well as the requirements for programmes and networks. A descriptive-analytical method was employed, with a structured questionnaire distributed to a sample of 202 participants, achieving a response rate of 75%. The results of the reliability analysis indicated strong consistency, with Cronbach's alpha values exceeding 0.7 for all studied variables. The findings suggest that e-management can significantly improve the quality of healthcare by streamlining processes, reducing errors, and ensuring timely service delivery. However, several notable gaps were identified, including insufficient training for staff, limited adoption of advanced technologies, and a lack of specialised administrative support for e-management systems. Regression analysis highlights important relationships between the quality of healthcare services and factors such as database accessibility, human resource readiness, and technical infrastructure, with statistically significant results across multiple variables ($p < 0.05$). The study emphasises the necessity of strategic investment in training programmes, enhancement of IT infrastructure, and the implementation of necessary administrative reforms to ensure optimal utilisation of e-management. It also offers practical recommendations to address the identified gaps and effectively integrate e-management systems, thereby contributing to improved quality of healthcare services and increased operational efficiency at Sabha Medical Centre.

أثر الإدارة الإلكترونية على جودة الخدمات الصحية: دراسة ميدانية مركز سبها الطبي

جبار منصور*، خالد شبل، معمر مشمور، احمد الساعدي وحسن مشمور

قسم إدارة الأعمال، كلية التجارة والعلوم السياسية، سبها، ليبيا.

الكلمات المفتاحية:
الإدارة الإلكترونية.
الرعاية الصحية.
الموارد البشرية.
البنية التحتية التقنية.
جودة الخدمات الصحية.

الملخص

تستكشف هذه الدراسة دور الإدارة الإلكترونية في تحسين جودة خدمات الرعاية الصحية بمركز سبها الطبي، مع التركيز على تحليل اعتمادها على العناصر البشرية والتقنية والإدارية، بالإضافة إلى متطلبات البرامج والشبكات. تم تطبيق منهج وصفي تحليلي، حيث تم توزيع استبيان منظم على عينة مكونة من 202 مشارك، وقد بلغ معدل الاستجابة 75%. وقد أظهرت نتائج تحليل موثوقية البيانات وجود اتساق قوي، حيث تجاوزت قيم ألفا كرونباخ 0.7 لجميع المتغيرات المدروسة. تشير النتائج إلى أن الإدارة الإلكترونية تمتلك القدرة على تحسين جودة الرعاية الصحية بشكل كبير من خلال تبسيط العمليات، وتقليل الأخطاء، وضمان تقديم الخدمات في الوقت المناسب. ومع ذلك، تم تحديد بعض الفجوات الملحوظة، والتي تشمل نقص التدريب المقدم للموظفين، والاعتماد المحدود على التقنيات المتقدمة، وغياب الدعم الإداري المتخصص لأنظمة الإدارة الإلكترونية. كما تسلط نتائج تحليل الانحدار الضوء على العلاقات المهمة بين جودة خدمات الرعاية الصحية وعوامل مثل إمكانية الوصول إلى قواعد البيانات، وجاهزية الموارد البشرية، والبنية التحتية التقنية، مع وجود

*Corresponding author.
E-mail addresses: jab.mansour@sebhau.edu.ly, (K. Shabl) kha.shebl@sebhau.edu.ly, (M. Mashmoor) moam.mashmor@fcps.sebhau.edu.ly, (A. Al-Saadi) ahme.mosbah3@fcps.sebhau.edu.ly, (H. Mashmoor) hass.mashour@fcps.sebhau.edu.ly.
Article History : Received 15 December 24 - Received in revised form 9 April 25 - Accepted 12 May 25

دلالات إحصائية مهمة عبر عدة متغيرات($p < 0.05$). تؤكد الدراسة على ضرورة الاستثمار الاستراتيجي في برامج التدريب، وتعزيز البنية التحتية لتكنولوجيا المعلومات، وتنفيذ الإصلاحات الإدارية اللازمة لضمان الاستخدام الأمثل للإدارة الإلكترونية. كما تقدم الدراسة توصيات عملية تهدف إلى معالجة الفجوات المحددة ودمج أنظمة الإدارة الإلكترونية بشكل فعال، مما يسهم في تحسين جودة خدمات الرعاية الصحية وزيادة الكفاءة التشغيلية في مركز سبها الطبي.

1. Introduction

The healthcare sector is one of the most critical components of Libya's socio-economic framework, playing a fundamental role in ensuring the well-being and quality of life of the population. However, this sector faces numerous challenges, including inadequate financial resources, a shortage of qualified healthcare professionals, and insufficient infrastructure. These factors contribute to the sub optimal delivery of healthcare services. Additionally, the increasing number of patients seeking medical care places further strain on public health facilities, exacerbating existing systemic inefficiencies [1] [2]

Enhancing the healthcare sector is imperative for improving service quality and ensuring equitable access to medical care. Key strategies for development include upgrading healthcare infrastructure to establish modern medical facilities equipped with advanced medical devices and technology [3]. Furthermore, the continuous training and professional development of both medical and administrative personnel are essential for improving performance and enhancing efficiency in service delivery [4] .Additionally, increasing financial investment in healthcare is necessary to sustain and expand healthcare programs and services [5]

One of the most promising strategies for healthcare system improvement in Libya is the transition to an e-health model [6]This transition entails leveraging digital technologies to enhance service quality and accessibility. In recent years, Libya has initiated steps towards adopting e-health systems. However, these efforts are hindered by several challenges, including underdeveloped technological infrastructure and a shortage of skilled personnel capable of implementing and managing digital healthcare systems.

Despite these obstacles, the adoption of electronic management (e-management) in healthcare institutions represents a pivotal step toward improving healthcare quality and meeting patient needs more effectively. Successful implementation necessitates coordinated efforts among government entities, healthcare institutions, and the private sector. Furthermore, investment in staff training and technological infrastructure development is essential. Research indicates that effective hospital administration and the integration of digital technologies can significantly enhance patient outcomes and operational efficiency [7] [8]Overcoming existing barriers to e-health implementation has the potential to transform Libya's healthcare sector, improving both service efficiency and patient satisfaction.

2. Problem Statement

Sabha Medical Center, one of the primary healthcare institutions in southern Libya, faces multiple challenges in its efforts to enhance the quality of healthcare services. These challenges include:

1. **Lack of coordination and communication**: Ineffective communication and coordination between medical and administrative teams result in delays in service provision and an increased risk of errors.
2. **Inadequate technical infrastructure**: The reliance on traditional, paper-based processes leads to inefficiencies, consuming significant time and effort, thereby hindering operational efficiency.
3. **Inefficient medical data management**: The current system for managing medical data is fragmented and disorganized, making access to critical patient information slow and cumbersome.
4. **Low patient satisfaction**: Enhancing patient experience and improving satisfaction levels remains a major challenge, as patients expect high-quality healthcare services with timely and responsive care.

In response to these challenges, Sabha Medical Center has undertaken the adoption of e-management as a strategic initiative to improve healthcare service quality. This study aims to assess the impact of this digital transformation on the quality of healthcare services from the perspective of both medical and administrative staff. Through a systematic evaluation, this research seeks to determine the effectiveness of e-management in addressing existing challenges and enhancing overall healthcare delivery at the center.

3. Research Questions

1. What is the impact of e-management on the quality of healthcare services from the perspective of the medical and administrative staff?
2. How do human requirements factors (staff training, technical competence, psychological preparedness) influence the quality of healthcare service delivery at Sabha Medical Centre?
3. How do programs and network requirements (software, technical networks) affect the quality of healthcare services?
4. How do administrative requirements (policies, procedures) affect the quality of healthcare services, particularly in facilitating or complicating e-management?
5. How do technical requirements (medical equipment, technological infrastructure) impact the effectiveness and quality of healthcare services?

4. Study Objectives

1. To identify the impact of e-management in improving the quality of healthcare services.
2. Examine the impact of human requirements on the quality of healthcare services: Determine how training, experience, and human competence influence the application of e-management.
3. Analyze the impact of programs and network requirements on the quality of healthcare services: Assess the role of software and technical networks in either enhancing or hindering the quality of healthcare services.
4. Evaluate the impact of administrative requirements on the quality of healthcare services: Study the influence of policies and administrative procedures in facilitating or complicating the application of e-management.
5. Examine the impact of technical requirements on the quality of healthcare services: Evaluate the effect of medical equipment and technological infrastructure on the effectiveness and quality of healthcare services.

5. Study Importance

- **Scientific Importance**

This study aims to contribute to a deeper understanding of the impact of e-management on the quality of healthcare services. Through detailed data analysis, the benefits and challenges associated with implementing e-management can be identified. The scientific results of this study may serve as an important reference for future research in this field, aiding in the development of new theories and improving current practices in healthcare management.

- **Practical Importance**

The practical importance of this study lies in highlighting how to enhance the use of technology in the healthcare sector. By providing practical examples and evidence-based recommendations, other healthcare institutions can adopt e-management more effectively. The study will offer tangible strategies to improve performance, increase efficiency, and reduce errors, ultimately contributing to the enhancement of healthcare service quality for patients.

Importance to the Healthcare Sector

Providing insights into the feasibility of implementing e-management at Sabha Medical Center is a key part of this study's significance. The

expected results may help make informed decisions regarding investments in health technology and policy development. Additionally, the study can provide practical guidance to healthcare officials on how to improve the quality of healthcare services through e-management, thereby enhancing patient satisfaction and service efficiency at the center.

6. Literature Review

E-management in the healthcare sector refers to the utilization of electronic systems and digital technologies for managing healthcare information, administrative processes, and service delivery. This approach encompasses various components, including electronic health records (EHR), telemedicine, electronic prescriptions, and comprehensive health information systems [9] .The primary objective of e-management is to enhance patient care, optimize workflows, and facilitate seamless communication among healthcare providers [10]

Existing literature emphasizes that transitioning to e-management in healthcare is not merely a technological enhancement but rather an extensive organizational transformation. This transformation necessitates a well-prepared workforce, strategic planning, administrative restructuring, and robust technical infrastructure [11] [12]Continuous professional training and systematic planning are fundamental to maximizing the benefits of e-management systems. Human resources play a crucial role in this transition, ensuring that healthcare organizations effectively implement and sustain these digital solutions to meet institutional objectives.

Several case studies highlight the pivotal role of well-trained human resources in the successful adoption of e-management within healthcare institutions. For instance, a study conducted by [13]demonstrated that hospitals implementing comprehensive training programs for electronic health record (EHR) systems experienced significant enhancements in patient care quality and operational efficiency. Similarly, research on the integration of e-management systems within large healthcare networks found that ongoing professional development in information technology (IT) and data management improved regulatory compliance and patient outcomes [14].

The administrative framework also plays a critical role in the effective implementation of e-management in healthcare settings. A study by [15]found that hospitals with well-defined strategic plans and adaptable organizational structures exhibited marked improvements in patient care quality and overall operational performance. Additionally, [3]reported that continuous staff training programs were integral to the successful adoption of e-management systems, particularly in rural healthcare environments.

Furthermore, prior research underscores the significance of technological infrastructure in facilitating the successful implementation of e-management systems [16] [17]. Essential components of this infrastructure include high-speed communication networks, modernized medical equipment, specialized software, and streamlined work methodologies that enable efficient access to critical healthcare data. Meeting these technological requirements is crucial for ensuring the seamless transition to electronic management systems.

In conclusion, the successful adoption of e-management systems in healthcare institutions necessitates a comprehensive technical infrastructure encompassing both hardware and software components. A robust IT infrastructure, secure and high-speed network systems, sophisticated software solutions, and efficient electronic document management tools are essential for achieving the objectives of healthcare organizations. Continuous investment in technological advancements and regular system updates are imperative to maintaining operational efficiency and aligning with the evolving landscape of digital healthcare management [18].

7. Research Methodology

This study employed a combination of descriptive and analytical methodologies, which are well-suited to the research objectives. The descriptive approach was utilized to delineate and define the core concepts related to e-management and the quality of healthcare services. In contrast, the analytical approach was implemented to assess the impact of e-management on healthcare service quality at Sabha Medical Center. Data were collected via a structured survey questionnaire distributed to the sample population and subsequently analyzed using the SPSS software package.

The descriptive methodology, which examines phenomena in their natural context, facilitated a dual analysis incorporating both qualitative and quantitative dimensions. The qualitative analysis enabled the exploration of the distinctive characteristics of the phenomena under study, while the quantitative analysis provided a means to measure the magnitude of these phenomena and to determine their correlational relationships with other relevant variables [19] .

- **Study Population and Sample**

The study population includes all employees at Sabha Medical Center, including both medical and administrative staff, totaling 900 employees, according to the administrative office data at the center. A random sampling technique was employed to select a study sample of 269 participants.

The determination of this sample size was guided by the widely recognized Morgan table for sample size estimation, ensuring that the selected sample is representative of the broader population and enhances the reliability and generalizability of the research findings.

- **Data Collection Tool**

To evaluate the clarity and appropriateness of the survey tools, the questionnaire was pre-tested with five graduate students from Sabha University who expressed an interest in e-management. After the initial testing, some items were reworded or revised based on feedback. The final questionnaire consisted of 32 items covering the main variables of the study, divided into six groups:

- Group 1: Contains 7 personal questions regarding gender, age, academic qualification, job level, nature of work, years of experience, and computer literacy.
- Group 2: Includes 5 statements representing human requirements.
- Group 3: Includes 5 statements representing Programs and Networks requirements.
- Group 4: Includes 5 statements representing administrative requirements.
- Group 5: Includes 5 statements representing technical requirements.
- Group 6: Includes 5 statements representing the quality of healthcare services.

- **Movement of Survey Forms**

After designing the survey and submitting it for review and necessary amendments, the questionnaires were distributed to the study sample. The following table outlines the movement of the distributed survey forms:

Description	Distributed Surveys	Returned Surveys	Unreturned Surveys	Lost Surveys + (Excluded Unreturned)	Valid Surveys for Analysis
Number	269	202	67	67	202
Percentage	100%	75%	25%	25%	75%

From the table above, we observe that 202 survey forms were returned, representing 75% of all distributed forms. Meanwhile, 67 forms were not returned, representing 25% of the distributed forms. There were no excluded forms, meaning that all returned forms were valid for analysis, accounting for 75% of all distributed forms.

- **Participant Profile**

The A total of 202 participants were included in this study. The gender distribution comprised 37% males and 63% females. In terms of age, 49% of the participants were between 25 and 35 years old, 32% were over 35 years old, and 19% were under 25 years old. Regarding educational qualifications, 23% of participants had attained a high school diploma, 41% held a higher diploma, 26% possessed a bachelor's degree, 8% had a master's degree, and 2% had a doctorate degree. In terms of occupational roles, the majority (84%) were employees, followed by department heads (10%), managers (4%), and section heads (1%). Concerning job nature, 40% worked in administrative roles, 20% in nursing, 15% in pharmacy, 13% in allied health, and 12% in medicine. With respect to work experience, 33% of participants had less than 5 years of professional experience, 30%

had 5 to 10 years, 20% had 11 to 15 years, and 17% had more than 15 years of experience. Finally, regarding computer literacy, 32% of participants reported intermediate proficiency, and 30% had very good knowledge, 17% had fair knowledge, 15% had excellent proficiency, and 6% had poor knowledge

8. Results and Discussion

The reliability of the measurement instruments was assessed using Cronbach's Alpha coefficient. The results indicated a Cronbach's Alpha of 0.842 for human requirements, 0.769 for programs and networks, 0.802 for administrative requirements, 0.809 for technical requirements, and 0.852 for the quality of healthcare services.

As all constructs exhibited Cronbach's Alpha values exceeding the 0.70 threshold, the findings confirm that the measurement scales demonstrate acceptable internal consistency and reliability (Nunnally & Bernstein, 1994). These results provide strong evidence that the selected items effectively capture the intended constructs, ensuring the robustness and validity of the study's measurement framework.

The following table presents the frequency distribution and percentage responses for each statement related to agreement on human requirements:

Table 2: Frequency Distribution, Percentage, and Mean of Sample Responses on All Statements Regarding Human Requirements

Statement	Very High	High	Medium	Low	Very Low	Agreement Level	Mean	Statistical Significance
1. The hospital has human resources capable of handling e-management applications.	9	78	54	34	27	High	3.040	0.615
Percentage	4.5%	38.6%	26.7%	16.8%	13.4%			
2. The hospital has specialists and technicians for maintaining electronic devices.	17	80	38	45	22	High	3.124	0.135
Percentage	8.4%	39.6%	18.8%	22.3%	10.9%			
3. The hospital trains human resources in applying e-management	16	48	37	70	31	Low	2.743	0.003
Percentage	7.9%	23.8%	18.3%	34.7%	15.3%			
4. The hospital attracts specialized personnel for managing and updating e-management systems.	14	47	47	64	30	Low	2.757	0.004
Percentage	6.9%	23.3%	23.3%	31.7%	14.9%			
5. There is psychological and motivational preparation for staff to work on e-management.	10	33	45	62	52	Low	2.441	0.000
Percentage	5.0%	16.3%	22.3%	30.7%	25.7%			

Table 2 shows the assessment of statements regarding human requirements in the hospital, using frequency distribution and percentages, along with the mean and significance. The data shows that: The assessment of human resources related to electronic administration at the hospital highlights both strengths and areas for improvement. The availability of highly skilled staff for managing electronic administration received a positive rating, with a mean score of 3.040 and a significance level of 0.615, indicating that the hospital has competent personnel in this field. Furthermore, the hospital's reliance on qualified specialists and technicians for electronic device maintenance was rated favorably, with a mean of 3.124 and a significance of 0.135, reflecting adequate technical support.

However, certain areas require attention. Statements regarding staff training, attracting specialized personnel, and providing psychological support for employees received lower ratings, with mean scores of 2.743, 2.757, and 2.441, respectively. These scores suggest a need for improved training programs, focused recruitment efforts for specialized roles, and stronger support for the well-being of the staff. In summary, while the hospital demonstrates strengths in electronic administration and technical maintenance, enhancing training, recruitment, and psychological support could contribute to a more robust workforce and ultimately improve service quality.

Table 3: Frequency Distribution, Percentage, and Mean of Sample Responses on All Statements Regarding Agreement on Programs and Networks

#	Statement	Very High	High	Medium	Low	Very Low	Level of Agreement	Mean	Significance Level
1	Databases help provide the necessary data for delivering high-quality services.	Frequency	39	85	35	27	16	High	3.515
		Percentage	19.3%	42.1%	17.3%	13.4%	7.9%		
2	The electronic systems used in the hospital are highly efficient in storing, classifying, retrieving, and updating required information.	Frequency	17	53	54	56	22	Low	2.936
		Percentage	8.4%	26.2%	26.7%	27.7%	10.9%		
3	Patient information and conditions are accurately recorded on the computer.	Frequency	18	45	56	53	30	Medium	2.842
		Percentage	8.9%	22.3%	27.7%	26.2%	14.9%		
4	The hospital has computer programs and networks characterized by transparency, providing high-quality services.	Frequency	15	33	41	69	44	Low	2.535
		Percentage	7.4%	16.3%	20.3%	34.2%	21.8%		
5	The hospital has comprehensive, adequate, and accessible databases for various departments and fields.	Frequency	10	39	47	60	46	Low	2.540
		Percentage	5.0%	19.3%	23.3%	29.7%	22.8%		

Table 3, which assesses the hospital's programs and network infrastructure based on frequency distribution, percentages, mean scores, and statistical significance for several operational areas. The analysis of database usage revealed a high level of satisfaction, with the statement on databases assisting in data provision for optimal service delivery achieving a mean score of 3.515 and a p-value of 0.000. This underscores the positive impact of database systems on service quality within the hospital. On the other hand, the efficiency of electronic systems in data storage, classification, retrieval, and updating scored lower, with a mean of 2.936 and a p-value of 0.428, suggesting performance challenges in these functions. Similarly, the suitability of software to meet operational requirements showed weaknesses, with a mean of 2.861 and a p-value of 0.099, indicating an urgent need for enhancement to meet hospital needs effectively.

Moreover, transparency in hospital programs and network systems for delivering quality services was rated low, with a mean of 2.535 and a statistically significant p-value of 0.000, highlighting substantial transparency issues. Lastly, the availability of comprehensive databases across hospital departments was also insufficient, as reflected by a mean score of 2.540 and a p-value of 0.000, indicating limited data accessibility across various departments and sectors.

In summary, while databases are effectively utilized to support service delivery, other aspects of the hospital's programs and network systems, such as electronic system efficiency, software transparency, and the scope of databases, show substantial deficiencies. These findings suggest that the hospital should prioritize technological enhancements to its infrastructure to address these challenges; as such improvements could play a pivotal role in elevating the quality of healthcare services offered.

Table 4: Frequency distribution, percentage, and mean responses for all statements related to administrative requirements

No.	Statements	Very High	High	Medium	Low	Very Low	Agreement Level	Mean	Statistical Significance
1	E-management enhances the quality and effectiveness of healthcare services.	27	84	35	37	19	High	3.312	0.000
Percentage		13.4%	41.6%	17.3%	18.3%	9.4%			
2	The hospital has specialized departments for e-management applications.	6	52	50	58	36	Low	2.673	0.000
Percentage		3.0%	25.7%	24.8%	28.7%	17.8%			
3	The hospital's administration evaluates and monitors e-management applications.	7	49	58	48	40	Medium	2.678	0.000
Percentage		3.5%	24.3%	28.7%	23.8%	19.8%			
4	The hospital provides training programs for staff based on e-management system needs.	18	46	44	58	36	Low	2.762	0.007
Percentage		8.9%	22.8%	21.8%	28.7%	17.8%			
5	The hospital provides an electronic administrative control system.	13	42	54	54	39	Medium	2.683	0.000
Percentage		6.4%	20.8%	26.7%	26.7%	19.3%			

The table 4 provides an analysis of the hospital's administrative requirements for e-management, evaluating responses based on mean scores and significance levels. The findings reveal both strengths and areas in need of improvement regarding the hospital's approach to e-management in enhancing healthcare services. The role of e-management in improving the quality and effectiveness of healthcare services received a high level of agreement, with a mean score of 3.312 and a significance level of 0.000, reflecting a strong perception of e-management as an important factor in elevating healthcare quality. Despite this positive outlook, other aspects of e-management in the hospital appear to be underdeveloped. The presence of specialized departments for e-management applications was rated low (mean score of 2.673, significance level of 0.000), pointing to a shortage of dedicated units to support e-management functions.

Efforts in evaluating and monitoring electronic applications were found to be moderate, with a mean score of 2.678 and significance level of 0.000, indicating some activity in this area that could benefit from reinforcement. Additionally, the provision of training programs for staff on e-management systems and applications received a low rating (mean score of 2.762, significance level of 0.007), suggesting a need for more targeted and comprehensive training. The presence of an electronic administrative control system received a medium rating (mean score of 2.683, significance level of 0.000), indicating that while some control mechanisms exist, they may require further enhancement to fully support e-management initiatives.

In summary, while e-management is perceived positively for its role in improving healthcare service quality, the hospital would benefit from establishing specialized e-management departments, enhancing staff training programs, and strengthening control systems. Addressing these areas could lead to more effective implementation of e-management applications, ultimately contributing to higher-quality and more efficient healthcare services.

Table 5: Frequency Distribution, Percentage, and Mean of Sample Responses on All Statements Regarding Agreement on Technical Requirements

No.	Statements	Very High	High	Medium	Low	Very Low	Agreement Level	Mean	Statistical Significance
1	The hospital utilizes electronic medical software and applications.	7	29	61	65	40	Low	2.495	0.000
Percentage		3.5%	14.4%	30.2%	32.2%	19.8%			
2	Patient information is accurately recorded in the hospital's electronic system.	18	45	56	53	30	Medium	2.861	0.099
Percentage		8.9%	22.3%	27.7%	26.2%	14.9%			
3	The hospital uses internal communication networks to monitor daily healthcare services.	22	57	44	53	26	High	2.980	0.817
Percentage		10.9%	28.2%	21.8%	26.2%	12.9%			
4	The hospital has advanced technological equipment to support e-management.	16	30	43	58	55	Low	2.475	0.000
Percentage		7.9%	14.9%	21.3%	28.7%	27.2%			
5	The hospital is networked with external healthcare entities.	15	34	63	54	36	Medium	2.693	0.000
Percentage		7.4%	16.8%	31.2%	26.7%	17.8%			

Table 5 provides an evaluation of the hospital's technical requirements related to e-management, assessed through frequency distribution, percentages, mean scores, and significance levels. The findings indicate varying levels of agreement across different technical aspects, underscoring areas both adequately addressed and in need of improvement. The hospital's use of electronic medical software and applications received a low rating, with a mean score of 2.495 and a significance level of 0.000, signaling a deficiency that could affect the efficiency and quality of healthcare services. Similarly, the availability of advanced technological equipment scored low as well (mean score of 2.475, significance level 0.000), indicating a shortfall in essential technological resources required for effective e-management implementation.

The accuracy of recording patient information on computers received a moderate rating (mean score of 2.842, significance level 0.061), reflecting adequate but improvable accuracy in data entry to support

high-quality service delivery. In terms of internal communication networks, the hospital received a relatively high rating (mean score of 2.980, significance level 0.817), suggesting that daily supervision and monitoring through internal networks are fairly effective but could benefit from additional enhancement. Finally, the assessment of network connectivity with external entities was rated as medium (mean score of 2.861, significance level 0.099), indicating an acceptable but improvable level of connectivity that could support better external coordination

Table 6: Frequency Distribution, Percentage, and Mean of Sample Responses on All Statements Regarding Agreement on the Quality of Health Services

No.	Statements	Very High	High	Medium	Low	Very Low	Agreement Level	Mean	Statistical Significance
1	The offices of doctors and staff, as well as patient waiting rooms, meet the expected healthcare service standards.	11	38	61	46	46	Medium	2.614	0.000
Percentage		5.4%	18.8%	30.2%	22.8%	22.8%			
2	Sabha Medical Center provides all the necessary medical equipment and devices required by patients.	23	45	51	38	45	Medium	2.817	0.050
Percentage		11.4%	22.3%	25.2%	18.8%	22.3%			
3	The general appearance of Sabha Medical Center is aligned with the nature of the healthcare services it provides.	18	49	57	53	25	Medium	2.911	0.279
Percentage		8.9%	24.3%	28.2%	26.2%	12.4%			
4	Sabha Medical Center is committed to providing the healthcare services expected by patients.	15	51	50	53	33	Low	2.812	0.027
Percentage		7.4%	25.2%	24.8%	26.2%	16.3%			
5	Sabha Medical Center is fully committed to delivering healthcare services on time and with the required speed.	19	31	47	45	60	Very Low	2.525	0.000
Percentage		9.4%	15.3%	23.3%	22.3%	29.7%			

Table 6 provides an analysis of agreement levels regarding the quality of healthcare services at the hospital, evaluated through frequency distribution, percentages, mean scores, and significance levels. The findings highlight both strengths and areas requiring attention. The highest-rated statement, "The general appearance of Sabha Medical Centre aligns with the nature of the healthcare services it provides," received a mean score of 2.911 with a significance level of 0.279, suggesting that the centre's appearance is well-aligned with its healthcare services. Following this, the statement on the adequacy of healthcare supplies, equipment, and medical devices ("Sabha Medical Centre provides all necessary healthcare supplies, equipment, and medical devices required by patients") received a moderate rating, with a mean score of 2.817 and a significance level of 0.050, indicating that the availability of essential medical supplies meets patient needs to a satisfactory extent.

However, the statement with the lowest level of agreement was related to the hospital's timeliness in service provision: "Sabha Medical Centre is fully committed to providing healthcare services on time and with the required speed," which had a mean score of 2.525 and a significance level of 0.000. This result reflects a noticeable shortfall in delivering healthcare services promptly, potentially impacting overall service quality.

Table 7: Results of the General Test on All Statements Related to Human, Technical, Administrative, and Technical Requirements

Variable	General Mean	Standard Deviation	Test Statistic	Statistical Significance
Human Requirements	2.821	0.918	-2.774	0.006
Programs and network Requirements	2.873	0.851	-2.116	0.036
Administrative Requirements	2.822	0.881	-2.876	0.004
technical Requirements	2.701	0.891	-4.769	0.000

The table above shows the general means, standard deviations, test statistics, and statistical significance for the statements related to human, programs and networks, administrative, and technical requirements in the hospital. The findings indicate that all variables are significant at different levels, with human and operational requirements being the most critical areas needing improvement.

8.1. Regression Analysis Results

Table 8: Regression Results

Dimension	B Value	Beta	Statistical Significance (p)
Human Requirements	0.454	0.32	0.000
Networks and Programs	0.587	0.40	0.000
Administrative	0.494	0.25	0.000
Technical	0.591	0.40	0.000
R^2	**0.72**		

Interpretation of Regression Results

The regression analysis results provide insights into the impact of different factors on the quality of healthcare services. Below is a detailed interpretation of the findings:

Technical requirements have the strongest impact ($\beta = 0.40$, $p = 0.000$): The technical infrastructure plays a crucial role in improving healthcare service quality.

Networks and Programs also play a major role ($\beta = 0.40$, $p = 0.000$): The effectiveness of network systems and healthcare software is a key factor in ensuring efficient service delivery.

The identical Beta value (0.40) to technical requirements implies that modern and well-integrated software solutions can have an impact similar to technical infrastructure. The strong significance ($p = 0.000$) reinforces the reliability of this finding.

Human requirements show a significant positive impact ($\beta = 0.32$, $p = 0.000$): The skills, qualifications, and readiness of healthcare professionals contribute substantially to service quality.

The lower Beta value (0.32) compared to technical factors suggests that while human resources are essential, their impact is slightly less than that of technology.

The p-value of 0.000 indicates a highly significant relationship.

Administrative requirements also influence Service uality ($\beta = 0.25$, $p = 0.000$): effective management, decision-making processes, and organizational policies contribute positively to healthcare service quality.

However, with a beta of 0.25, the effect of administrative requirements is the weakest among the four factors.

The statistical significance ($p = 0.000$) confirms that this factor still plays an important role.

Overall Model Fit ($R^2 = 0.72$):

The R^2 value of 0.72 indicates that 72% of the variance in healthcare service quality can be explained by the four independent variables.

This demonstrates a strong model fit, meaning that the selected factors have a considerable impact on service quality

8.2. Discussion of Results in Light of Previous Literature

The study results align with previous literature on the impact of human, technical, administrative, and operational requirements on healthcare service quality. Below is a discussion of each variable in light of

relevant literature:

Human Requirements: The results show a moderate and statistically significant relationship between human requirements and healthcare service quality (R = 0.454, p = 0.000). This is consistent with studies like [15] [20] which emphasize that improving healthcare providers' skills and continuous training lead to better healthcare service quality [21] also found that employee satisfaction in the healthcare sector is closely related to improved patient care. ، The absence of interaction, awareness, and responsiveness from human resources prevents management from achieving its objectives, even if it possesses the latest electronic devices and equipment. To achieve the goals of electronic management, it is essential to provide a human infrastructure comprised of qualified personnel in terms of knowledge, technical skills, and abilities, who possess specific competencies to effectively handle the tools and elements of electronic management.

Programs and network: The study results indicate a moderately strong relationship between technical requirements and healthcare service quality (R = 0.587, p = 0.000). This aligns with studies such as [17] [22], which suggest that improving healthcare technology and networks enhances service efficiency and improves patient outcomes [23] also highlighted that technology usage in healthcare reduces medical errors and improves patient tracking.

Administrative Requirements: A moderate relationship between administrative requirements and healthcare service quality was found (R = 0.494, p = 0.000). This aligns with studies like [13] which highlight that effective administration and leadership significantly enhance healthcare service quality. [24] Found that improving administrative processes leads to higher patient satisfaction and more efficient service delivery.

Technical Requirements: The results show a moderately strong relationship between technical requirements and healthcare service quality (R = 0.591, p = 0.000). This supports studies like [25] found that investments in medical technology lead to better patient outcomes and reduced waiting times.

9. Recommendations for Future Studies

1. Future studies should include multiple healthcare institutions from different regions to ensure the generalizability of the results. This would help understand the effects of e-management in various contexts and conditions.
2. Future research should focus on evaluating the long-term impact of e-management applications on healthcare service quality to identify sustainable benefits and potential challenges.
3. Longitudinal studies should be conducted over extended periods to assess the effect of changes in human, technical, administrative, and operational requirements on healthcare service quality over time.
4. Future studies should explore how the integration of human, technical, administrative, and operational requirements can be optimized to achieve the best quality healthcare services.

10. Conclusion

This study has demonstrated that human, technical, administrative, and operational requirements significantly influence the quality of healthcare services. The results highlight that strengthening these elements contributes meaningfully to enhancing service delivery within hospitals and medical centres. Nonetheless, the research also identified key challenges—most notably, a shortage of qualified human resources—underscoring the necessity of targeted development in this area to boost both the efficiency and effectiveness of healthcare provision.

Sustained efforts are essential to advance administrative and technical systems while ensuring continuous professional training for healthcare personnel. These improvements are critical to achieving consistent, high-quality, and comprehensive healthcare services. Furthermore, the study recommends that future research incorporate an analysis of external factors and consider emerging technological and administrative innovations to provide a more holistic understanding of the interplay between these requirements and service quality.

11. Reference

[1] G. G. L. Services, “An Overview of the Healthcare System in Libya,” 2024.

[2] “World Health Organization (WHO). (2021). Libya Health System Profile. Geneva: WHO Press.”.

[3] دور الإدارة الإلكترونية في تحسين جودة الخدمات الصحية في “ ,قسمي .ب .ط ,”المؤسسات الإستشفائية العمومية 2017.

[4] أبعاد جودة الخدمات الصحية دورها في “ ,بن تربح .ت .ب . andمعزوزي .ع . ,”تحقيق التميز 2018.

[5] أثر استخدام الإدارة الإلكترونية في تطوير العمل في المؤسسات “ ,الكاشف .ي .ع ,”الصحية الحكومية ,جامعة القدس 2017.

[6] أسباب التحول من الإدارة التقليدية إلى الإدارة الإلكترونية في “ ,بوشعالة .ح .ع ,”ليبيا ,جامعة بنغازي 2024.

[7] جامعة محمد ”,دور الإدارة الإلكترونية في تحسين الأداء الوظيفي“ ,شريهان .ل ,خيضر 2016.

[8] تأثير الحوكمة الإلكترونية للتطبيقات “ ,محمد .ا .ر andسليم .م .ا ,شبل .ع . . ,”الحديثة في تحسين جودة الخدمات الصحية في مصر ,جامعة السادات 2021.

[9] H. S. K. S. Y. C. A. A. &. E. E. B. Ngusie, “ Healthcare providers’ readiness for electronic health record adoption: A cross-sectional study during pre-implementation phase,” BMC Health Services Research, vol. 22(1), p. 282, 2022.

[10] Blumenthal, D. and Tavenner, M, “ The “Meaningful Use” Regulation for Electronic Health Records,” New England Journal of Medicine, vol. 363, pp. 501-504, 2010.

[11] إمكانية تطبيق الإدارة الإلكترونية بالمنظمات الصناعية الليبية “ ,المسماري .م .ع: ,”دراسة ميدانية على مديرى الإدارات بالمنظمات الصناعية الليبية العامة جامعة بنغازي 2012.

[12] أثر استخدام الإدارة الإلكترونية على جودة “ ,بوعمامه مريم، بوهده شهرزاد ,”الخدمات في المؤسسات العمومية ,جامعة الجزائر 2020.

[13] A. M. Mosadeghrad, “Factors Influencing Healthcare Service Quality,” Tehran University of Medical Sciences, vol. 3, no. 2, pp. 77-89, 2014.

[14] A. R. Abdullah, “Adoption of Electronic Health Records in Saudi Arabia Hospitals: Knowledge and Usage,” Journal of King Saud University , vol. 35, no. 2, 2022.

[15] S. S. J. &. H. E. Smith, “Nurses’ experiences of working in rural hospitals: An integrative review,” Journal of Nursing Management, vol. 27, no. 3, p. 482–490, 2019.

[16] متطلبات :الأبعاد المستقبلية لحكومة الإلكترونية في الأردن“ ,خير .م .ا .ش .ج ,”النجاح المجلة الأردنية في إدارة الأعمال vol. 3, pp. 278-295, 2006.

[17] D. Barrett, “Strong Communication Skills a must for today's leaders,” Handbook of Business Strategy, vol. 7, no. 1, pp. 385-390, (2006), Handbook of Business Strategy, Emerald.

[18] أثر الادارة الالكترونية على جودة “ ,الهزايمة .ص .ا andالشراري .م .ف دراسة ميدانية من وجهة نظر موظفي مديرية الشؤون الصحية –الخدمات العلاجية ,مجلة العلوم الإنسانية والطبيعية ”,بمحافظة القريات (الحكومية) 2023.

[19] البحث العلمي مفهومه أدواته ,عبد الحق .ك andعبيدات .ذ ,عبد الرحمن .ع . ,أساليبه 2021.

[20] دور تخطيط الموارد البشرية في تحسين جودة الخدمات الصحية “ ,درويش .ع .ع: ,”دراسة ميدانية على المشافي العامة في الساحل ,جامعة تشرين p. 84, 2013.

[21] دور الإدارة الإلكترونية في رفع جودة “ ,عباس .م . .ف andعبد .ح .ع .ح .ش ,”الخدمات الصحية في المستشفى الكندي التعليمي ,مجلة كلية بغداد العراق vol. 2018, no. 56, pp. 121-144, 2018.

[22] R. Cruz-Martínez, J. Wentzel, . A. Rikke and P. Noort,

"Supporting Self-Management of Cardiovascular Diseases Through Remote Monitoring Technologies: Metaethnography Review of Frameworks, Models, and Theories Used in Research and Development," Journal of Medical Internet Research, vol. 22, no. 5, 2020.

[23] Gideon Danso, Obed Owumbornyi Lasim, "The Impact of Health Information Technology on Patient Safety," 2024.

[24] أثر تطبيق الإدارة الإلكترونية " ,فتحيه طحيشات.خالد جمعه، أ.صلاح الأشقر، أ جامعة المرقب ",على جودة الخدمات الصحية في ظل جائحة كورونا, 2021.

[25] J. Lee, "The impact of health information technology on disparity of process of care," International Journal for Equity in Health, 2015.