

**How to Cite:**

Aloyuni, S. A., & Al-Mutairi, A. M. M. (2023). The impact of electronic dealing on the quality of health service delivery. *International Journal of Health Sciences*, 7(S1), 1508–1526. <https://doi.org/10.53730/ijhs.v7nS1.14371>

## **The impact of electronic dealing on the quality of health service delivery**

**Saleh Abdullah Aloyuni**

Department of Public Health, College of Applied Medical Sciences, Majmaah University, Al Majmaah 11952, Saudi Arabia

Corresponding author email: [S.aloyuni@mu.edu.sa](mailto:S.aloyuni@mu.edu.sa)

**Abdul Majeed Muidh Al-Mutairi**

College of Business Administration Department of Health Services and Hospitals Management Applied, Majmaah University, Majma'h, Ministry of Health, Saudi Arabia

**Abstract**---The current study aimed to determine the extent to which electronic transactions affect the quality of healthcare services. To achieve the study's goal, a descriptive and analytical approach was adopted to evaluate healthcare services, and a questionnaire was distributed to administrative staff in Saudi hospitals. The data was processed, classified, hypotheses tested, and results analyzed, and conclusions and appropriate recommendations were drawn. A total of 120 questionnaires were distributed, and it was found that all were valid for statistical analysis. The research found that the level of electronic transactions in all its requirements (administrative, human, financial, technical, and security) in Saudi hospitals is high, and there is a high level of quality in the provision of healthcare services in Saudi hospitals. There is a direct effect of electronic transactions in all their requirements (administrative, human, financial, technical, and security) on the quality of healthcare services in Saudi hospitals. The study provided several recommendations, including the need to provide a suitable working environment for electronic transactions, equip the necessary technological infrastructure, provide all the requirements for electronic transactions, provide training courses and programs for employees to increase their ability and capabilities to handle electronic transactions, and raise awareness among individuals about the importance of electronic transactions and the use of technological applications to improve the quality and efficiency of healthcare services.

**Keywords**---electronic transactions, healthcare services, administrative staff, Saudi hospitals, technological infrastructure.

## Introduction

The 21st century is known for its rapid development and progress, where change is the only constant factor in our world. As a result of these continuous developments in various aspects of economic and social life, healthcare institutions had to keep up with this progress and change in order to reduce their administrative burdens, improve the quality of their healthcare services, and be able to compete to achieve their goals and ensure their sustainability. This requires changing the prevailing concepts of administrative work and management of institutions that follow the traditional system to the modern concept of e-management (Bukair, 2022). Technology and its developments have forced agencies to transition from traditional to electronic methods, which has contributed to the development of administrative work methods and provided opportunities to improve administrative communication channels and thus provide an effective administrative environment that contributes to reducing effort and time. As a result of the continuous developments in the 21st century, we cannot stop to count the enormous changes that occur every day in programs, equipment, and administrative concepts. Despite all these rapid developments, the Kingdom is still seeking to transition to e-management in its hospitals (Moumina, 2020).

Healthcare institutions, like other institutions, must improve the quality of the services they provide and use their resources optimally to fully satisfy the needs and requirements of beneficiaries to ensure their continuity and achieve the highest levels of service quality. Keeping pace with global progress and technology has become of utmost importance in both administrative and medical fields, which requires a responsible and efficient management to monitor internal and external changes, conduct necessary studies, and implement appropriate changes to achieve continuous improvement in their services and achieve the highest levels of quality.

Healthcare organizations in all their forms are the cornerstone of providing healthcare services, and thus they are the refuge for patients and those seeking health. With the increasing pressures on healthcare institutions, especially in our time, where diseases and epidemics have spread, leading to increased movement and travel of people from one place to another, and what this entails of rapid spread of diseases and epidemics, the current example of which is the COVID-19 pandemic, which caused confusion among hospital administrations, making it difficult for them to deal with the increasing number of patients. This, in turn, led to increased pressure on hospitals, and this increase was characterized by features that were not available in the past, which forced workers to find means and ways to receive these requests and respond to them as quickly as possible, which requires the adoption and implementation of modern technological methods in these healthcare institutions.

Many studies have highlighted the concept of healthcare service quality and the importance of the quality of the services provided. One study (Bahr, 2019) emphasized the importance of healthcare service quality, while another study (Al-Sheikh & Al-Maghrabi, 2017) showed that the use of electronic transactions had a positive impact on improving the quality of healthcare services provided to

patients, as it revealed that there are many benefits to introducing electronic transactions in Saudi hospitals. The importance of this study lies in addressing two important topics in the field of management: electronic transactions and the quality of healthcare services provided. The study highlights the importance of electronic transactions and their role in improving the quality of healthcare services. It also focuses on the healthcare services provided by Saudi hospitals, both from a theoretical and practical perspective. In light of the above, the study aims to identify the reality of electronic transactions and their impact on the quality of healthcare services.

## **Literature Review**

Abu Daff and Ashour (2021) aimed to determine the impact of e-management on the quality of healthcare services at Al-Shifa Medical Complex in Gaza, Palestine. The study showed that the medical complex has moderate requirements for e-management applications, with a relative weight of 60.83%, and that the quality of healthcare services at the medical complex reached an average level, with a relative weight of 67.09%. There was a statistically significant correlation between e-management and overall healthcare service quality. The study made several recommendations, including adopting a policy of transitioning from traditional management to e-management, providing the necessary financial resources for e-management implementation, purchasing and updating necessary equipment, and continuing to train and equip staff with modern qualifications, systems, and technologies.

Al-Bdour and Al-Ksasbeh (2019) aimed to analyze the impact of electronic health management on total quality management in hospitals in Irbid Governorate, Jordan. The study yielded several results, including that electronic health management has a statistically significant impact (at the P 0.05 level) on total quality management in Irbid hospital. Electronic health management had a statistically significant impact (at the P 0.05 level) on knowledge management technology in Irbid hospital. The study recommends committing to evaluating electronic health management as a unit and avoiding fragmentation to have a strong positive impact on total quality management through knowledge management technologies and supporting their core activities.

Al-Sheikh and Al-Maghrabi (2017) aimed to identify the requirements for implementing e-management for health insurance in Sudan and the obstacles that prevent meeting these requirements, as well as to identify ways to address these obstacles through studying differences in the sample. The study found that there is general computer illiteracy among the public due to the scarcity of human resources specialized in systems, programs, and networks. The study's recommendations include raising public awareness of the importance of e-government, restoring the necessary infrastructure, and enacting legislation to protect e-commerce.

Moreover, Al-Sheikh and Shafter (2020) aimed to determine whether there is a relationship between accepting traditional management by the Sudanese healthcare sector and the possibility of implementing e-management. The study attempted to address some gaps in email and used historical methods and

descriptive analysis. The study found that there is computer illiteracy among the public (customer base) and a scarcity of human resources (employees) specialized in systems, programs, and networks. The study's recommendations include raising public awareness of the importance of e-government, restoring the necessary infrastructure, enacting legislation to protect e-commerce, and working on purchasing equipment, designing systems and networks, and maintaining them.

Bahri and Nour Eldin (2021) aimed to determine the reality of implementing e-management of human resources in Algerian healthcare institutions and its contribution to improving healthcare service quality. After analyzing the data, the study found a strong correlation between e-management of human resources and healthcare service quality. There is a positive effect of e-management of human resources on the healthcare services provided, which is the effect of quality.

Badi and Al-Rabghi (2022) aimed to identify the reality of implementing the unified electronic health record at Yanbu General Hospital and its ability to integrate information related to patients' health status. The study relied on the descriptive method in the case study approach. One of the most important results of the study was achieving the primary goal of a unified health record, which is the exchange of information between different centers. The difficulties faced by doctors varied, and the most prominent of these were the lack of experience in dealing with systems and the need for continuous technical support. Therefore, the study recommended finding solutions to these obstacles through continuous training of staff, providing continuous technical support, and investing in infrastructure. The study also proposed a proposed vision for the implementation of the unified electronic health record in Saudi Arabia.

Bukair (2022) aimed to uncover the supported and hindered communicative effects among the public in Saudi society (citizens and residents) with health applications through smartphones and identify the factors affecting the public's acceptance of health applications. The study found factors affecting the public's acceptance in Saudi society, including the communicative effects of health applications through smartphones and the public's acceptance factors for using them through smartphones, except for the lack of a correlation relationship for the realism effects and both behavioral intentions and perceived usefulness for the public's acceptance of use. The study also found no correlation for satisfaction effects and actual use of applications.

Al-Shahib (2022) aimed to identify the digital public relations activities and mechanisms of the Saudi government's health sector and determine their role in supporting communication systems during the "COVID-19 crisis" and spreading awareness of the importance of digital transformation in organizations. The study found a statistically significant relationship at a significance level of less than (0.05) between the availability of application requirements for digital public relations management and good performance for providing electronic health services. The Facebook account of the Ministry of Health is used only to convey communication messages, while the website is used to register for providing health services efficiently, supporting the ministry's digital transformation. The study recommended the necessity of utilizing social media, especially Facebook,

to support communication with the public, enhance the implementation of public relations activities, and implement sufficient educational and specialized programs for public health through social media, not limited to COVID-19 only.

Moumena (2020) aimed to determine the effectiveness of the Saudi healthcare sector's use of health information systems and electronic medical records and was applied to a sample of hospitals and clinics in Riyadh. The study found that the system used to store data is not integrated, as records are dealt with through a separate electronic system from the management of other services in the hospital, making it difficult to exchange data between the two systems when needed. Both paper and electronic formats are used to serve patients, the administrative staff, and deal with the region (the Directorate of Health Affairs). Only technical and records staff have full access to the systems, and higher approvals always lead to modifications. Patient data and information are stored on-site to maintain data confidentiality and facilitate retrieval when needed.

### **Theoretical framework**

The widespread popularity of new business models, intensive use of e-commerce, and the explosion of e-commerce and other digital activities indicate the need for these areas, and the technologies, systems, and tools for modern management based on creative administrative thinking, new working methods, innovative practices, and integrated business solutions, in short, the need for electronic management.

### **Electronic transactions**

Before delving into the details of implementing electronic transactions, it is important to stop at a series of concepts and terms related to information technology - which have recently emerged - and are increasingly directed towards the means and tools generated by information technology, which contribute to the development of the work of institutions and organizations.

### **Objectives of implementing electronic transactions**

The success of implementing electronic transactions is reflected in a number of benefits in reforming various areas of government, including increasing efficiency by increasing the productivity of the public sector, decentralization by empowering the workforce, activating accountability among stakeholders by making public sector employees more accountable for their decisions, and improving work management for the benefit of citizen comfort (Fathiya, 2018).

The main objectives of the transition to electronic transactions can be identified as follows (Al-Othmani, 2023):

- Increasing the level of administrative efficiency: Perhaps the most important aspect of e-government is improving the efficiency of government work execution, by increasing worker productivity and reducing the percentage of idle labor.

- Improving the level of services provided to citizens: This is reflected in providing services to local citizens, giving them the opportunity to obtain fast and cheap services, enabling citizens to practice democracy and participate in all issues, as well as increasing the efficiency of local units, thus saving time and reducing the time required to complete transactions.
- Achieving effective communication and reducing administrative complexity.
- Reducing operating costs and continuously improving productivity.
- Using information and communication technology in institutions to create a better work environment and build a technological infrastructure that facilitates easy work.
- Ensuring that information flow is accurate, adequate, timely, and ready.
- Providing effective and supportive mechanisms for decision-making by the higher levels of government.

### **The importance of electronic transactions**

It is no secret that the transition to electronic applications and the execution of government transactions is beneficial for providing services to beneficiaries, whether individuals, governments, or private institutions. Governments and countries are committed to implementing and launching e-government projects to achieve many benefits that are not limited to service seekers, but extend to the government entities providing these services.

The importance of electronic transactions in government work can be summarized as follows (Ismail, 2015):

- Improving government services by facilitating transactions and reducing the time and cost of completing them.
- Providing the best services to individuals and corporate sectors to achieve the highest level of satisfaction.
- Enhancing partnerships between the public and private sectors to increase productivity.
- Integration and coordination between different government departments.
- Increasing transparency in government transactions and procedures.
- Changing society's view of the prevailing image of bureaucracy and routine in public sector services.

### **Reasons for the transition to electronic transactions**

It can be said that the transition to e-government is not a luxury, but a necessity resulting from global change, where the idea of integration, participation, and information utilization has become one of the determinants of the success of any institution. Scientific and technological progress and the continuous need for continuous improvement of output quality and ensuring operational safety require the development of management towards e-management. The reasons for the electronic transition can be summarized as follows (Fatiha, 2018):

- Complex procedures and operations and their impact on increasing business costs.

- Immediate decisions and recommendations, resulting in a malfunction in implementation.
- The need to unify data.
- The need to provide trading data to employees.
- Adherence to technological development and reliance on information in decision making.
- Citizens must be educated in culture and awareness, by encouraging the use of modern technology.
- Rationalizing government spending by reducing the number of employees and reducing the use of paper documents.
- Combating corruption and mismanagement in government departments.
- Enhancing future planning and development projects for the government.

### **Healthcare service quality**

Healthcare service quality is an excellent way to improve institutions' quality by providing excellent health services to meet patients' requirements and obtain their satisfaction and make full use of available resources. It is the result of the significant increase in the number of patients visiting healthcare institutions in recent years and the increasing demand. This can sometimes lead to further deterioration of their health status, which directly affects the quality of healthcare services provided. All of this requires decision-makers in healthcare institutions to find means and methods and employ various scientific methods to help solve this problem for rapid response, reduce waiting times for patients, and improve the quality of medical services provided, such as applying electronic transactions that help improve the quality of medical services provided.

The concept of quality has been a topic of interest for various researchers, and quality is defined as meeting customer requirements and expectations. It is also a philosophical and systematic approach to organizational management, which includes a framework of principles, procedures, and tools that help provide a guiding framework for all issues in the organization. The philosophy is rooted in introducing human relationships into management, looking at the organization as an open system that promotes management through participation, based on strategic planning, and seeks a strong commitment to customer satisfaction and the continuity of control (Dawood and Abdul Matalib, 2020). As for the concept of healthcare service quality, there are many specific definitions, and there is no agreement among specialists because each one looks at the concept from a certain perspective according to their own point of view. The more the focus is on training healthcare providers in hospitals and healthcare institutions, the deeper their knowledge becomes, which directly and positively reflects on the depth of the concept and hence the quality of the services provided.

Healthcare service quality is defined as "the application of medical sciences and technology to achieve maximum health benefits without increasing risks, such that the degree of quality is determined by the optimal balance between risks and benefits." It is also defined as "the ability to establish an interactive and mutually beneficial relationship between healthcare facilities and beneficiaries through the exchange of information about health needs and how to obtain them."

It is also defined as "the medical services related to human health provided by hospitals and healthcare units to beneficiaries through the assessment of their health needs and the provision of medical services according to previously promised methods" (Al-Abbasi and Naaroura, 2020). It is defined as "those services related to promoting, maintaining, and restoring health, including all personal and people-related health services." The concept of healthcare service quality is one of the most important decisive factors in the healthcare organization because it helps to enhance competitive advantage, achieve organizational stability, and achieve long-term success and excellence (Lakhoua and Ben Zvra, 2020).

### **The importance of quality in healthcare facilities**

The quality of healthcare service is one of the most important issues in marketing healthcare services, as it is one of the main areas of concern for hospital administrations, healthcare recipients, doctors, and funding agencies in order to achieve their desired objectives and benefits. Over the past few decades, government spending on healthcare services has increased to meet the needs of beneficiaries, with the use of modern technologies and tools to expand health coverage, increase efficiency and expertise to improve and develop healthcare systems (Al-Abbasi and Naaroura, 2020).

### **Objectives of healthcare service quality**

Quality is one of the methods adopted by healthcare institutions to ensure good workmanship in its various aspects, and then take all necessary measures and procedures to continuously improve it within a framework in which the following objectives are achieved:

- Meeting the desires of beneficiaries that fulfill their aspirations and make them fully satisfied with the services provided to them, the appropriateness of treatment and care for various medical conditions, and understanding the opinions of patients and measuring their satisfaction with the healthcare services provided to them.
- This measurement is an important tool in the field of health planning, training on the relationship between beneficiaries, service providers, and healthcare institutions, enhancing and improving communication channels, performing their functions efficiently, and achieving a high level of productivity. By providing the required level of healthcare to patients, the main objectives of the quality system are achieved (Al-Abbasi and Naaroura, 2020).

### **Reasons for the importance of healthcare services**

The development of healthcare services has been one of the fundamental pillars of successive development plans, as the aim is to provide the content of healthcare services and support the development of the health level and capacities of citizens. Hospitals are important humanitarian, social, and service institutions, as well as an integral part of society, which is affected by it at the same time, and strives to provide direct services to patients. It is important that patients are

satisfied with these services and their quality for the following reasons (Al-Dawood & Abdulmutalib, 2020):

- The ultimate goal of healthcare services is to ensure the physical and mental health of patients.
- Providing high-quality healthcare services contributes to achieving patient satisfaction, which is a means to achieve many other goals, such as: patient cooperation with doctors and nursing facilities, and their acceptance of implementing their recommendations in order to achieve accurate diagnosis and appropriate treatment.
- Providing effective healthcare services requires continuous and responsible participation of patients through effective communication channels between healthcare providers and patients to determine the first step in creating communication channels between healthcare service beneficiaries and providers.
- In order to focus more on the beneficiaries of healthcare services as the most important factor in the external environment, hospitals must continue to develop and perform their tasks effectively.

### **Distinctive features of healthcare services**

The healthcare services provided by hospitals are diverse and multiple, which is reflected in the methods and mechanisms by which these services are provided to beneficiaries of patients. These characteristics can be identified through:

- Considering them as public services that aim to achieve the public interest of various parties whether they are individuals, organizations, or groups - due to their high quality, as they are related to human life and rehabilitation.
- Laws and regulations affect the work of hospitals in general, especially if they are part of the public sector, and the need for direct communication between hospitals and the patients they deal with. Healthcare services are usually provided only in the presence of the patient for examination, diagnosis, treatment, and analysis. It is difficult for hospital management to adopt the same standards and economic concepts applied to other services in their work, as healthcare services are related to people and require the provision of healthcare services to their seekers, and not to provide any apologies for providing these services at any time, even temporarily (Sous & others, 2020).

### **Ways to improve the quality of healthcare facilities**

Healthcare facilities face many challenges that hinder their work, such as high treatment costs, low quality of healthcare services, and low levels of satisfaction. Therefore, healthcare facilities are more sensitive because they recognize that the individual is a key factor in the development process, and is the beneficiary on which success and stability depend, which benefits all societies (Luqouaq & Bin Zafra, 2020).

There are many ways to improve the quality of work in healthcare facilities and their employees, which can be summarized as follows:

- Performance measurement: This method is one of the most commonly used ways to measure performance improvement, and can take various statistical forms - individual or aggregated in the form of single or aggregated frequency histograms - in order to achieve a balance between the different forms of performance, which may take different grades, including the level of expectation and ambition (Hamed, 2020).
- Checklist: This method is based on choosing a specific phrase or sentence that includes agreement on the required opinion about the presented situation. This method differs from other quantitative performance measurement methods, which are often used to evaluate the performance of patients or hospital visitors to understand their perception of many medical activities or events provided to them and then measure the impact of this performance.
- Employee comparison system: This method is evaluated based on the opinions of senior officials on the performance of their employees and the extent to which each contributes to following up on the required work. One of the most notable drawbacks of this method is that it is subject to personal judgment more than other indicators (Al-Obaid, 2020).
- Goal setting: This approach is consistent with the meaning of the term "management by objectives," that is, the level of performance of healthcare workers is measured by their actual contribution to achieving the goals set for them.

### **Research design**

The research will use a descriptive approach, since it is appropriate to achieve the objectives of the study.

### **Research population**

The community as administrative workers in Saudi hospitals, and through a simple random sampling method, the sample size reached 120 individuals.

### **Research tool**

The questionnaire consists of sample characteristics and phrases related to the study's axes (the electronic communication axis, the quality of healthcare services axis), containing 34 phrases, and a five-point Likert scale was used.

Table 1: Response levels to phrases in the study tool

| Level     | Degree     |
|-----------|------------|
| Very low  | 1.00-1.79  |
| Low       | 1.80-2.59  |
| Moderate  | 2.60-3.39  |
| High      | 3.40- 4.19 |
| Very high | 5.00-4.20  |

## Data analysis

The research used the following methods through SPSS software:

- Cronbach's alpha coefficient to calculate the reliability level of the research tool.
- Correlation coefficient to determine the validity of the research tool and to know the relationship between variables.
- Ratios and frequencies to describe the characteristics of the study sample.
- Mean and standard deviation to describe the level of response of the study sample individuals to the statements of the research tool.
- Simple regression equation to test the study hypotheses.

## Validity

Table 2: Correlation coefficients for the terms of the study tool

| Paragraph                          | Correlation coefficient | Significance | Paragraph      | Correlation coefficient | Significance |
|------------------------------------|-------------------------|--------------|----------------|-------------------------|--------------|
| Electronic transactions            |                         |              |                |                         |              |
| Administrative                     |                         |              | Human resource |                         |              |
| 1                                  | 0.530**                 | 0.000        | 1              | 0.734**                 | 0.004        |
| 2                                  | 0.516**                 | 0.000        | 2              | 0.716**                 | 0.000        |
| 3                                  | 0.681**                 | 0.000        | 3              | 0.762**                 | 0.000        |
| 4                                  | 0.538**                 | 0.004        | 4              | 0.831**                 | 0.000        |
| Financial                          |                         |              | Technical      |                         |              |
| 1                                  | 0.835**                 | 0.000        | 1              | 0.802**                 | 0.000        |
| 2                                  | 0.781**                 | 0.000        | 2              | 0.787**                 | 0.000        |
| 3                                  | 0.817**                 | 0.000        | 3              | 0.875**                 | 0.000        |
| 4                                  | 0.706**                 | 0.000        | 4              | 0.702**                 | 0.000        |
| Security                           |                         |              |                |                         |              |
| 1                                  | 0.638**                 | 0.000        | 3              | 0.791**                 | 0.000        |
| 2                                  | 0.763**                 | 0.000        | ----           | -----                   | ----         |
| Quality of health service delivery |                         |              |                |                         |              |
| 1                                  | 0.618**                 | 0.000        | 9              | 0.712**                 | 0.000        |
| 2                                  | 0.840**                 | 0.000        | 10             | 0.779**                 | 0.000        |
| 3                                  | 0.800**                 | 0.000        | 11             | 0.810**                 | 0.000        |
| 4                                  | 0.845**                 | 0.000        | 12             | 0.838**                 | 0.000        |
| 5                                  | 0.788**                 | 0.000        | 13             | 0.725**                 | 0.000        |
| 6                                  | 0.680**                 |              | 14             | 0.672**                 | 0.000        |
| 7                                  | 0.679**                 |              | 15             | 0.729**                 | 0.000        |
| 8                                  | 0.679**                 |              | ----           | -----                   | -----        |

It appears that all the statements in the study tool are statistically significant at 0.01, indicating that the tool has a high level of validity and is valid for the purposes of the study.

## Reliability

Table 3: Reliability of the research tool using Cronbach's alpha method

| Axis                               | N  | Cronbach's alpha |
|------------------------------------|----|------------------|
| Electronic transactions            | 19 | 0.949            |
| Quality of health service delivery | 15 | 0.939            |
| Total                              | 34 | 0.967            |

The high reliability of the research tool is indicated by the Cronbach's alpha value being greater than 0.70.

## Analysis and Results

### Sample characteristics

Table 4: Distribution of Study Sample by Gender

| Categories | N   | Percentage (%) |
|------------|-----|----------------|
| Male       | 96  | 80             |
| Female     | 24  | 20             |
| Total      | 120 | 100            |

Table 5: Distribution of Study Sample by Age

| Categories                    | N   | Percentage (%) |
|-------------------------------|-----|----------------|
| Less than 25 years            | 16  | 13.3           |
| From 25 to less than 35 years | 40  | 33.3           |
| From 35 to less than 45       | 56  | 46.7           |
| ≥ 45 years                    | 8   | 6.7            |
| Total                         | 120 | 100            |

Table 6: Distribution of Study Sample by Educational Qualifications

| Categories | N   | Percentage (%) |
|------------|-----|----------------|
| Middle     | 28  | 23.3           |
| Bachelor's | 60  | 50.0           |
| Masters    | 28  | 23.3           |
| PhD        | 4   | 3.3            |
| Total      | 120 | 100            |

Table 7: Characteristics by Job Title

| Categories       | N   | Percentage (%) |
|------------------|-----|----------------|
| Health staff     | 100 | 83.3           |
| Managerial staff | 20  | 16.7           |
| Total            | 120 | 100            |

Table 8: Characteristics according to years of experience

| Categories                   | N   | Percentage (%) |
|------------------------------|-----|----------------|
| Less than 5 years            | 15  | 12.5           |
| From 5 to less than 10 years | 24  | 20.0           |
| From 10 to less than 15      | 44  | 36.7           |
| ≥ 15 years                   | 36  | 30.0           |
| Total                        | 120 | 100            |

### **Electronic interaction Administrative requirements**

Table 9: Administrative Requirements Phrases

| Phrase                                                                                                         | Mean  | Deviation | Arrangement | Agreement |
|----------------------------------------------------------------------------------------------------------------|-------|-----------|-------------|-----------|
| The hospital is committed to implementing an electronic interaction policy                                     | 4.167 | 0.823     | 1           | High      |
| The hospital management is committed to monitoring and evaluating the implementation of electronic interaction | 4.100 | 0.703     | 2           | High      |
| The hospital seeks the assistance of expert entities in the field of electronic interaction                    | 4.067 | 0.730     | 3           | High      |
| There is an electronic administrative oversight system in the hospital                                         | 3.733 | 0.932     | 4           | High      |
| Average                                                                                                        | 4.017 | 0.797     |             | High      |

It appears that the phrase "The hospital is committed to implementing an electronic interaction policy" is the most important with a value of 4.167, while the phrase "There is an electronic administrative oversight system in the hospital" is the least important with a value of 3.733. It also shows that all the phrases have a high agreement, indicating a high level of administrative requirements with a mean of 4.017 and a standard deviation of 0.797.

### Human resources requirements

Table 10: Human Resources Requirements Phrases

| Phrase                                                                                                  | Mean  | Deviation | Arrangement | Agreement |
|---------------------------------------------------------------------------------------------------------|-------|-----------|-------------|-----------|
| The hospital management is committed to training employees on the application of electronic interaction | 3.967 | 0.755     | 4           | High      |
| The hospital has specialists in the field of maintenance of electronic devices and equipment            | 4.067 | 0.775     | 2           | High      |
| The human resources in the hospital have a great ability to use electronic applications                 | 4.000 | 0.820     | 3           | High      |
| The hospital provides a specialized management in the field of electronic interaction                   | 4.067 | 0.683     | 1           | High      |
| Average                                                                                                 | 4.025 | 0.758     | High        |           |

It appears that the phrase "The hospital provides a specialized management in the field of electronic interaction" is the most important with a value of 4.067, while the phrase "The hospital management is committed to training employees on the application of electronic interaction" is the least important with a value of 3.967. It also shows that all the phrases have a high agreement, indicating a high level of human resources requirements with a mean of 4.025 and a standard deviation of 0.758.

### Financial requirements

Table 9: Financial Requirements Phrases

| Phrase                                                                                                    | Mean  | Deviation | Arrangement | Agreement |
|-----------------------------------------------------------------------------------------------------------|-------|-----------|-------------|-----------|
| The hospital provides sufficient financial support to develop the technological infrastructure            | 3.933 | 0.857     | 1           | High      |
| The hospital has a sufficient budget to provide and constantly update technological devices and equipment | 3.667 | 0.833     | 3           | High      |
| The hospital provides a budget for the maintenance of technological devices and equipment                 | 3.800 | 0.913     | 2           | High      |
| The hospital provides a budget to incentivize excellence in the field of electronic interaction           | 3.533 | 0.995     | 4           | High      |
| Average                                                                                                   | 3.733 | 0.900     | High        |           |

It appears that the phrase "The hospital provides sufficient financial support to develop the technological infrastructure" is the most important with a value of 3.933, while the phrase "The hospital provides a budget to incentivize excellence

in the field of electronic interaction" is the least important with a value of 3.533. It also shows that all the phrases have a high agreement, indicating a high level of financial requirements with a mean of 3.733 and a standard deviation of 0.900.

### Technical requirements

Table 10: Technical Requirements phrases

| Phrase                                                                                                 | Mean  | Deviation | Arrangement | Agreement |
|--------------------------------------------------------------------------------------------------------|-------|-----------|-------------|-----------|
| The hospital has devices and equipment that contribute to the application of electronic interaction    | 4.000 | 0.733     | 2           | High      |
| The hospital uses electronic medical programs and applications                                         | 4.000 | 0.635     | 1           | High      |
| The software used in the hospital is compatible with the work system to provide health services easily | 3.867 | 0.849     | 3           | High      |
| The hospital uses electronic communication networks to monitor and evaluate daily work                 | 3.833 | 0.737     | 4           | High      |
| Average                                                                                                | 3.925 | 0.739     | High        |           |

It appears that the phrase "The hospital uses electronic medical programs and applications" is the most important with a value of 4.000, while the phrase "The hospital uses electronic communication networks to monitor and evaluate daily work" is the least important with a value of 3.833. It also shows that all the phrases have a high agreement, indicating a high level of technical requirements with a mean of 3.925 and a standard deviation of 0.739.

### Security requirements

Table 11: Security Requirements phrases

| Phrase                                                                            | Mean  | Deviation | Arrangement | Agreement |
|-----------------------------------------------------------------------------------|-------|-----------|-------------|-----------|
| The hospital provides highly efficient protection systems to maintain information | 4.033 | 0.879     | 2           | High      |
| The hospital keeps backups of data and information                                | 4.067 | 0.775     | 1           | High      |
| The hospital applies a database control system                                    | 4.067 | 0.775     | 1           | High      |
| Average                                                                           | 4.056 | 0.810     | High        |           |

It appears that the phrases "The hospital keeps backups of data and information" and "The hospital applies a database control system" are the most important with a value of 4.067, while the phrase "The hospital provides highly efficient protection systems to maintain information" is the least important with a value of 4.033. It also shows that all the phrases have a high agreement, indicating a high level of security requirements with a mean of 4.056 and a standard deviation of

0.810. It appears from the above that the level of electronic interaction in Saudi hospitals is high with a mean of 3.946 and a standard deviation of 0.800.

### Healthcare quality

Table 12: Healthcare quality phrases

| Phrase                                                                                   | Mean  | Deviation | Arrangement | Agreement |
|------------------------------------------------------------------------------------------|-------|-----------|-------------|-----------|
| The hospital provides all required healthcare specialties                                | 3.867 | 1.061     | 14          | High      |
| The hospital cares about patient suggestions and feedback                                | 4.133 | 0.766     | 8           | High      |
| The hospital enjoys the trust of patients and stakeholders                               | 4.200 | 0.751     | 3           | Very high |
| The hospital provides healthcare services with a high degree of accuracy and reliability | 4.067 | 0.775     | 11          | High      |
| The hospital provides healthcare services at all times                                   | 4.233 | 0.618     | 2           | Very high |
| Hospital staff care about assisting patients                                             | 4.267 | 0.775     | 1           | Very high |
| Patients trust the experience and capabilities of hospital staff                         | 4.033 | 0.660     | 13          | High      |
| Patients feel safe when dealing with the hospital                                        | 4.167 | 0.640     | 4           | High      |
| The hospital has a good reputation in the community                                      | 4.100 | 0.653     | 9           | High      |
| The hospital has a good reputation in the community                                      | 4.167 | 0.640     | 4           | High      |
| The hospital provides individual attention to each patient                               | 4.167 | 0.781     | 5           | High      |
| The hospital has modern technological devices and equipment                              | 4.133 | 0.721     | 7           | High      |
| The hospital has a convenient location that is easy to access                            | 4.167 | 0.823     | 6           | High      |
| The hospital's design is suitable for providing healthcare services                      | 4.067 | 0.932     | 12          | High      |

|                                                                                |       |       |    |      |
|--------------------------------------------------------------------------------|-------|-------|----|------|
| The hospital cares about a high degree of appearance and cleanliness for staff | 4.100 | 0.834 | 10 | High |
| Average                                                                        | 1.049 | 3.920 |    | High |

It appears that the phrase "Hospital staff care about assisting patients" is the most important with a value of 4.267, while the phrase "The hospital provides all required healthcare specialties" is the least important with a value of 3.867. It also shows that three phrases had a very high agreement, while twelve phrases had a high agreement, indicating that there is a high level of quality in providing healthcare services in Saudi hospitals with a mean of 4.124 and a standard deviation of 0.762.

### Discussion

- There is a high level of electronic interaction in all its requirements (administrative, human resources, financial, technical, security) in Saudi hospitals.
- There is a high level of quality in the provision of healthcare services in Saudi hospitals with a mean of 4.124 and a standard deviation of 0.762.
- There is a direct effect of electronic interaction in all its requirements (administrative, human resources, financial, technical, security) on the quality of healthcare services provided in Saudi hospitals, which is consistent with the results of a study by Abu Daff and Ashour (2021), Al-Bdoor and Al-Kasasbeh (2019), and Bahri and Nour El-Din (2021).

### Conclusions

In conclusion, the impact of electronic dealing on the quality of health service delivery in Saudi hospitals is significant. The study has shown that there is a direct effect of electronic interaction in all its requirements on the quality of healthcare services provided. Therefore, it is essential to focus on providing a suitable work environment for electronic interaction, equipping the technological infrastructure, and providing training courses to employees to increase their ability and capabilities in electronic interaction. Additionally, raising awareness of the importance of electronic interaction and the use of technological applications can contribute to improving the level of quality of services provided and increasing their efficiency and effectiveness. Conducting further studies and research related to electronic interaction and how to benefit from information technology in increasing performance and productivity levels in institutions can also be beneficial. Ultimately, these recommendations can help enhance the quality of healthcare services provided in Saudi hospitals and ensure that patients receive the best possible care.

### Recommendations

- It is necessary to work on providing a suitable work environment for electronic interaction, equipping the technological infrastructure that achieves this, providing all the requirements for the electronic interaction

process, and providing training courses and programs for employees to increase their ability and capabilities in electronic interaction.

- Focus on raising awareness of the importance of electronic interaction and the use of technological applications, which contributes to improving the level of quality of the services provided and increasing their efficiency and effectiveness.
- Work on conducting studies and research related to electronic interaction and how to benefit from information technology in increasing performance and productivity levels in institutions.

## References

1. Al-Dawood, Wafa Hussein Ahmed, and Abdel Mutaleb, Mohamed Mahdhar (2020) The Impact of Human Resource Training on Improving the Quality of Healthcare Services: A Case Study of King Abdullah University Hospital in the Hashemite Kingdom of Jordan. *Journal of Legal Research and Studies*, 96, 215-240.
2. Al-Shihab, Khaled bin Ali Abdullah (2022) Digital Technological Systems for Public Relations: An Analytical Study of the Saudi Ministry of Health. *Egyptian Journal of Media Research*, 78, 595-633.
3. Al-Sheikh Awad Youssef Ahmed and Al-Maghribi Mohamed Al-Fateh Mahmoud Bashir (2017), The Role of E-Management in Enhancing the Performance of Health Organizations: An Applied Study of the National Health Insurance Fund in Sudan (Unpublished Doctoral Dissertation), University of the Holy Quran and Islamic Sciences, Omdurman.
4. Al-Sheikh Awad Youssef Ahmed and Shafitr, Mohamed Al-Shatwi Ahmadah (2020). The Role of E-Management in Enhancing the Efficiency of Healthcare Organizations: An Applied Study of the National Health Insurance Fund in Sudan. *Journal of Zitouna University*, 35, 220-240.
5. Al-Abbasi, Ramzi, and Taaroura Bou Bakr (2020) Contribution to Improving the Quality of Healthcare Services from the Patients' Perspective: A Field Study on a Sample of Patients from the General Hospital of Tamrine El Eyaachi in Annaba Province. *Journal of the Institute of Economic Sciences*, 23, 1, 857-877.
6. Al-Obaid, Sarah Al-Hamoud (2020). Evaluating the Quality of Healthcare Services from Patients' Perspectives: An Applied Study on Individuals who Received Treatment Inside Syria. *Reehan Journal for Scientific Publishing*, 1, 53-70.
7. Al-Othmani, Mustafa (2023). Digital Human Resource Management and Its Role in Improving Government Performance.
8. Al-Muaioufi, Hanan Mohammed and Bouzahab, Iman Al-Salihin (2022). The Impact of E-Banking Service Quality on Customer Satisfaction: Customer Trust as a Mediating Factor - An Applied Study on the National Commercial Bank in Geryan. *Ramaah Journal for Research and Studies*, 67, 629-662.
9. Abu Daf, Omar Mahmoud Khalil and Ashour, Youssef Hussein Mahmoud (2021). The Impact of E-Management on the Quality of Healthcare Services: A Field Study on Al-Shifa Medical Complex in Gaza (Unpublished Master's Thesis). Islamic University of Gaza, Gaza.
10. Bahri, Abu Bakr and Nour Eddine, Radi (2021). Applying Electronic Human Resource Management as a Mechanism to Improve the Quality of Healthcare

- Services: A Case Study of Shaban Hamdoun Public Hospital. *Economic and Business Finance Journal*, 8, 1, 685-698.
11. Badour, Norah Ghazi Khalid and Al-Kassabeh, Mohammad Mufid Osman (2019). *Electronic Health Management and Its Impact on Total Quality Management: The Mediating Role of Knowledge Management Technology in Hospitals in Irbid Governorate* (Unpublished Doctoral Dissertation), Al-Albayt University, Mafrq.
  12. Bakir, Mohammed Abdul (2022). Public Acceptance of Healthcare Applications via Smart Phone Technologies in Saudi Arabia and Their Communicational Effects: A Study within the Framework of the Technology Acceptance Model and Effects. *Media Research Journal*, 60, 2, 625-680.
  13. Fatiha, Gharik (2018). Risks of Electronic Transactions and Mechanisms for Dealing with Them. *Journal of Law and Humanities*, 11, 1, 247-259.
  14. Hamid, Osman Taj Al-Sir Mas'ad (2020). Evaluating the Quality of Healthcare Services Provided to Patients in Government Hospitals: Applied Study in the Greater Wad Medani Locality, Al-Jazeera State, Sudan 2020. *International Journal of Economics and Business*, 2, 318-332.
  15. Ismail, Reda Mousilli Ahmed (2015). The Role of Electronic Interaction Strategies in Developing the Performance of Egyptian Banks. *The Scientific Journal of Economics and Commerce*, 1, 99-130.
  16. Lakouak, Abdel Razzak and Ibn Dhafrah, Fayez Awad Saad (2020). Improving the Quality of Healthcare Services using Mystery Shopper Program: An Applied Study on a Sample of Health Centers in Saudi Arabia. *Journal of the Institute of Economic Sciences*, 23, 2, 431-451.
  17. Murad, Nahla Kamal El-Din Mohammed and Ahmed El-Samani, Abdel Motaleb (2023). *Building a Framework for Sudanese E-Government: A Case Study of the Ministry of Education - Khartoum State* (Unpublished Doctoral Dissertation), University of Khartoum.
  18. Musa, Mahmoud Kamal and Arabi, Abeer (2020). The Impact of Information Technology Capabilities on Improving the Quality of Healthcare Services: A Field Study in University Hospitals in Upper Egypt. *North African Economics Journal*, 16, 23, 273-294.
  19. Mu'minah, E'timad Mohammed Saleh (2020). The Effectiveness of Using Electronic Health Information Systems and Medical Records: A Study of a Sample of Private Clinics and Hospitals in Riyadh. *I'alam Journal*, 56-35.
  20. Omar, Sanaa Mohamed Zahran (2022). *Electronic Governance as an Approach in Health Crisis Management: Digital Response to the Coronavirus Pandemic*. *Future Journal of Social Sciences*, 10, 1, 59-104.
  21. Shadli, Eman Mahmoud (2023). Perceived Barriers to Adopting Electronic Customer Relationship Management in Egyptian Public Banks: An Empirical Study. *Journal of the Higher Institute of Qualitative Studies*, 3, 1, 262-197.
  22. Sous, Nasouh, Omar, Ahd, and Malik, Ghadir (2020). The Role of Factor Analysis in Identifying Factors Affecting the Quality of Healthcare Services provided to Patients in Private Hospitals in Nablus Governorate from Patients' Perspective. *Journal of the University of Independence for Research*, 5, 1, 315-358.