



## Digital Transformation Of The Health Sector Through The Requirements Of Vision 2030

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### Introduction

Ministry of Health in the Kingdom of Saudi Arabia decision number (7/88) dated: 25/4/1441H approving the regulations governing remote healthcare (telemedicine) in the Kingdom of Saudi Arabia. These regulations derive their legitimacy from the healthcare strategy prepared by the council and issued by the Cabinet decision number 391, dated 7/12/7231, which includes the center's mission of linking and supervising healthcare entities in the Kingdom, as well as developing regulations governing remote healthcare (telemedicine) in the Kingdom of Saudi Arabia.

Therefore, these regulations have come as one of the tasks and roles of the National Health Information Center, keeping pace with the rapid use of modern technology in healthcare and in alignment with the national transformation to achieve Vision 2030.

Telemedicine is defined as the use of information and communication technologies in medical services. It is also known as Telemedicine and is one of the most advanced sub-specialties of biomedical engineering worldwide.

The concept of telemedicine emerged as a result of the advancement of information technology and its impact on many professions, notably the medical profession. Telemedicine primarily revolves around the concept of accelerating communication between the physician and the patient, and providing high-quality healthcare services to recipients without the need for appointments or physical presence.

The aim of telemedicine is to improve the quality of services provided by reducing the time and financial costs associated with treatment, especially for individuals residing in remote, rural, or isolated areas who may receive less or more complicated medical services compared to those provided to residents of capitals or large cities. This is achieved by expediting the receipt of medical service, with the patient communicating electronically with the specialist physician, receiving examination or diagnosis, and treatment prescriptions without the need for a physical appointment with the physician, or personal attendance, thereby saving the cost of transportation or travel, the long time that may harm the patient's health, as well as the possibility of employing this concept in emergency situations or health crises such as epidemics, wars, or crises that may hinder movement.

Among the other benefits of telemedicine that can be addressed is its use "in remote medical conferences" to facilitate the effective transfer of conference effectiveness and exchange of expertise between healthcare providers, enhancing benefits.

Remote healthcare networks (telemedicine) have also provided an effective service for communication between physicians, whether in consultations, scientific conferences, or other medical educational activities. Hence, there was a need to establish rules regulating the work of remote healthcare (telemedicine) in the Kingdom and to mitigate the negative effects that may arise from the use of this technology.

The Ministry of Health in the Kingdom of Saudi Arabia has expanded its scope of services in telemedicine to cover the "Sehha" application, which provides visual medical consultations and allows all citizens to obtain face-to-face medical consultation with their physicians from anywhere in the Kingdom, in a groundbreaking move within the framework of Vision 2030, accomplished in a record time of no more than two months, enabling modern technology and the latest technological advancements in healthcare services.

The vision of the Ministry of Health revolves around developing healthcare in the Kingdom of Saudi Arabia in terms of quality, standards, and equality in providing healthcare services. To achieve this vision, the Ministry of Health has developed a work strategy and a five-year plan that will make e-health a key factor in developing and providing these

services. Therefore, the Ministry has developed an e-health strategy and a five-year action plan in collaboration with Saudi and international consultants. The e-health strategy supports the Ministry's main goals, which include patient care, linking service providers to all levels of healthcare, measuring the performance of healthcare provision, and transforming healthcare provision in line with global standards.

Through this study, we will analyze the impact of telemedicine technology application on improving healthcare provided in the Kingdom, and its direct effect on service providers and recipients, including patients and visitors.

### **Research importance**

The importance of the research is to address one of the most important topics related to health care for the Saudi Ministry of Health at the present time, which is telemedicine (communication medicine), because it plays an important role in developing community health, supports the work of the health sector, contributes to reducing costs, accelerating the provision of services, and addressing social determinants. For health and enhances interaction between the health sector and other sectors in society, with the aim of enhancing the application of this technology and activating its role in the country and to serve health service providers and achieve the maximum benefit for service recipients as well, which has a positive impact on the health care provided in our dear Kingdom.

### **The study Problem**

The Kingdom, like the rest of the countries of the world, is facing an increasing demand for health services for reasons, the most important of which are the increasing population numbers and the geographical expansion of the Kingdom. Therefore, the Ministry of Health has adopted a policy of telemedicine (telemedicine), which is a policy that relies on employing communications technology to provide health care, and administering it to all citizens regardless of... Regardless of their place of living, the research problem is to identify:

The impact of telemedicine policy (communication medicine) on health care provided to citizens.

### **The questions of the study**

The main research question:

What is the impact of the telemedicine policy in facilitating access to health care for citizens?

It includes several sub-questions:

- What is the nature of the telemedicine policy in supporting the quality of health care provided?
- What is the impact of implementing the telemedicine policy on the distribution of health services in the Kingdom?
- What are the opportunities and challenges facing the implementation of communication medicine policy?

### **The study objectives**

- Identify the nature of the telemedicine policy in supporting the quality of health care provided.
- Identify the impact of implementing the telemedicine policy on the distribution of health services in the Kingdom
- Identify the opportunities and challenges facing the implementation of communication medicine policy

### **Study methodology**

Study methodology: The researcher shall use the descriptive method.

Study tool: The questionnaire will be used to collect data.

### **Study Limits**

The objective research limits are to identify the importance of communication medicine in improving health care in the Ministry of Health in the Kingdom of Saudi Arabia. The human research limits are represented by all the medical staff of the Saudi Ministry of Health who have applied communication medicine technology to provide health services to clarify its impact on the performance of the Ministry of Health and the quality of its services. And all patients receiving health care through telemedicine technology. The time limits of the research are for the first semester of the year 1443 AH, and the spatial limits of the research are determined at the main headquarters of the Ministry of Health in the city of Riyadh.

## **Chapter Two: The Theoretical Framework of the Study**

### **Previous Studies**

## **Chapter Two: Theoretical Framework / Previous Studies**

### **Section One: The Theoretical Framework**

**This section includes the following main elements:**

#### **(1-1) Types of Telemedicine:**

**Exploring different forms of remote healthcare delivery.**

#### **(2-1) Applications of Telemedicine:**

**Examining the various uses of telemedicine in healthcare.**

#### **(3-1) Reasons for Using Telemedicine / Telehealth:**

**Investigating the motivations behind employing telemedicine.****(4-1) Advantages of Telemedicine / Telehealth:****Highlighting the benefits associated with telemedicine.****(5-1) Disadvantages of Telemedicine:****Analyzing the drawbacks and challenges of telemedicine.****(1-2) Telemedicine / Telehealth in the Kingdom of Saudi Arabia:****Focusing on the implementation and utilization of telemedicine in Saudi Arabia.****Theoretical Framework**

According to Munira (2021), telemedicine or telehealth is defined as the use of information and communication technology (ICT) to provide healthcare services such as diagnosis, examination, and medical consultation to patients. The aim is to facilitate communication between healthcare providers and patients.

Telemedicine has facilitated communication among healthcare professionals for exchanging information and expertise through consultations, scientific conferences, or other medical educational activities. It can also be used to manage healthcare crises remotely using information system technologies, establish comprehensive medical databases, and disseminate medical information.

There are several types of telemedicine in healthcare delivery based on the method used:

(1-1) Regarding the types of telemedicine / telehealth, Munira (2021) mentioned that telemedicine types vary based on the transmission method as follows:

**Synchronous Transmission:** In this type, interaction and communication occur directly between the patient and the physician.

**Asynchronous Transmission:** The patient transfers medical data to the physician via computer or video and awaits a response later.

(1-2) In terms of the technology used, the categories of telemedicine are divided into:

**Remote Monitoring:** Medical data of the patient from remote areas is transmitted to the hospital through various devices such as life guard devices that monitor vital signs (heart rate, temperature, blood pressure, respiration), and life shirt devices that capture signals of heart and respiratory functions.

**Store-and-Forward Telemedicine:** The patient sends medical data via email to the physician, including various medical information, and the physician responds later. This process is used in non-urgent cases.

**Video Conferencing Telemedicine:** This involves holding a medical conference with the doctor, consultant, and patient. The doctor and consultant study the case before the conference, provide their medical opinion during the conference, and then send a written report containing their medical opinion.

**Home Care:** This involves providing healthcare to the patient by employing modern communication methods for transmitting audio and video, and providing a special device at the patient's home to transmit vital medical information (respiration, heart rate, blood pressure) to the specialist physician wherever they are located.

The aforementioned types of telemedicine are applied to healthcare services to take advantage of their features in developing healthcare services and improving the overall healthcare system. Notable applications of telemedicine include:

(2-1) Ahmed (2015) mentioned applications of telemedicine / telehealth:

Introduction of technology into the healthcare field and the development of telemedicine technology, alongside traditional methods of healthcare, have contributed to the development of telemedicine applications in healthcare in general. Some of these applications include:

**Patient Portal as an Alternative to In-Person Diagnosis:**

Telemedicine services provide a feature that allows monitoring various patient conditions through an electronic portal. Through this portal, patients can communicate with specialist doctors or nurses remotely, request prescriptions, review results and summaries of previous visits, and schedule new appointments.

**Virtual Appointments as an Alternative to In-Person Appointments:**

Clinics provide virtual appointments for patients to meet with doctors through online video calls. These appointments enable patients to receive healthcare from specialist doctors without the need for in-person visits. These services serve as an alternative to quick check-ups and provide clear guidance to patients by prescribing medications and home care strategies by the doctor.

**Remote Monitoring: Controlling Infection Spread and Facilitating Services**

Telemedicine technologies enable healthcare professionals to monitor patients remotely. Some notable applications include:

Mobile or web-based applications for downloading medical information, such as reading blood pressure, glucose levels, and heart rate, and transmitting them to the doctor.

Devices measuring body functions and wirelessly transmitting them to the doctor, or wearable devices transmitting vital body function measurements.

Home monitoring devices for seniors or dementia patients detecting changes in normal activities, such as falls.

Virtual Consultations between Doctors and Consultants:

Telemedicine services provide doctors and consultants with the opportunity to utilize technology to provide better care to their patients. Virtual consultation enables them to obtain information from specialists and exchange advice for better diagnosis of the patient's condition.

**Personal Health Records: Advanced System**

This involves an electronic personal health record system (PHR) containing a set of patient health-related information that enables them to control and maintain it. Accessible at any time and through any internet-connected device, PHR can provide vital information to emergency personnel quickly and easily, such as current diagnoses, medications, patient allergies, and contact information for the treating physician, among others.

**Personal Health Apps: Excellent Health System**

Several apps are designed to help individuals organize various medical information securely in one place. These digital tools can help patients store personal information confidentially, record vital signs daily, schedule medication reminders, and include personal care apps such as weight loss or calorie counting apps.

As with any new technology, telemedicine has its drawbacks alongside its advantages. Following the discussion of its benefits, it is essential to highlight the drawbacks to clarify the concept and its applications from all aspects, especially as it is a relatively new concept that is bound to face challenges in implementation and use by service recipients. These drawbacks include:

Costs of acquiring the technological equipment and resources facilitating telemedicine, such as wired and wireless communication tools and medical equipment, or if telemedicine services are limited to the wealthy and those able to afford them!

Lack of a reliable communication network in remote and distant areas or its weakness.

Electronic security issues between doctors and patients that may affect patient privacy.

Increased time allocated to setting up medical consultations, as the telemedicine process may increase the time required for diagnosing the medical condition compared to those that could be done directly when the patient is present in the hospital or clinic.

We will shed light on the application of telemedicine / telehealth in our beloved Kingdom of Saudi Arabia through what has been presented on the website of the Saudi Ministry of Health about this technology and how the Kingdom is directing its application, care, and development.

The Saudi Ministry of Health is committed to telemedicine within the framework of its efforts to achieve significant progress in digital advancement and e-health, through the implementation of the National E-Health Strategy, and complete transition towards an electronic transaction system in the sector.

Telemedicine is considered one of the most important modern digital communication methods that has facilitated communication between healthcare providers and patients, alleviating the burden of travel and offering treatment through an electronic audiovisual and informational system.

Since the inception of telemedicine in the Kingdom, the Ministry of Health aims to increase the number of beneficiaries of this application, enabling them to have greater access to visual medical consultations via smartphones. This is part of its endeavor to leverage modern technologies to enhance communication with service beneficiaries and provide them with the opportunity to obtain medical consultations from specialists.

This application provides visual, auditory, and written communication services from 8 am to midnight throughout the week, and from 4 pm to 12 am on weekends. Users can directly connect with specialized doctors through the application, present their case, which the doctor can view, and then respond to the caller's inquiries and provide medical consultation regarding the condition and necessary medical procedures.

Moreover, the Ministry of Health has implemented the E-Health Initiative as part of the National Transformation Program 2020, aiming to improve healthcare effectiveness, support sector workers by providing patient data wherever they are, and provide clinical and administrative support services, and remote consultations. This serves to improve the healthcare process, achieve telemedicine goals, and reduce medical and diagnostic errors and side effects of various diseases as much as possible.

## **Second Section / Previous Studies:**

In a study conducted by Ahmed and Abdulqadir (2015), the aim was to benefit from remote healthcare, particularly the methodology of video conferencing. The study concluded with several results supporting the success of remote healthcare application. Notable outcomes include the patient's ability to book appointments and conduct interviews without going to the hospital, facilitating communication between doctors to share expertise, reducing travel costs for both patients and doctors, providing medical expertise to remote areas, offering comfort for patients who struggle with travel, and mitigating the impact of centralized doctors in specific regions. Recommendations from the study include institutional support to promote the culture of remote healthcare, creating a suitable verification method for doctors abroad before integrating them into medical communication systems, and emphasizing the efficiency of electronic healthcare systems for overall healthcare improvement.

In a study by Alqadi (2021), the goal was to explore the effectiveness of remote healthcare in Saudi Arabia. The study found that previous and conclusive evidence suggests that remote medical care and telemedicine tools not only facilitate access to healthcare services but also create costs for both the government and patients. The research approach relied on theoretical approaches through documented previous studies to evaluate and analyze studies related to examining how

remote healthcare applications can help patients receive expected healthcare anytime, anywhere, reducing potential travel costs for seeking professional healthcare or finding specific medical specialists.

A study by Aziz (2015) aimed to discuss remote healthcare, its importance, historical development, analyze various means of information transfer using remote healthcare, and highlight the benefits it offers to patients and doctors. The study concluded that remote healthcare is a fantastic new development that enhances the level of medical and healthcare services in general.

Another study conducted by Marina Takane indicated that communication technology can provide cost-effective and high-quality solutions for healthcare, especially through remote healthcare. The study examined the impact of remote healthcare in four fields: pathology, dermatology, psychiatry, and radiology. It found that radiology had the highest rate among the four fields globally.

A study by the World Health Organization (2010) focused on a mobile telemedicine system for home care and patient monitoring. The study highlighted the effectiveness of remote healthcare at home and executed a remote healthcare system using mobile phones to monitor patients through a reliable and speedy 232-RS interface.

These studies collectively underline the positive impact of remote healthcare, ranging from accessibility and cost-effectiveness to the advancement of medical services and global healthcare.

**The previous studies:**

which were reviewed, addressed the significance of implementing telemedicine or telehealth technology to enhance the quality of healthcare services provided. They focused on improving communication among service providers and facilitating the exchange of expertise and consultations, especially in rare and complex medical cases. They also highlighted the potential benefits of utilizing various modern technologies to improve patient treatment, particularly in remote and distant areas, and to save costs, time, and effort. Moreover, they emphasized maximizing the utilization of available resources. In this research, the researcher aims to continue what previous researchers initiated in clarifying the importance of applying telemedicine standards and elucidating this through analyzing the opinions of service recipients (patients) and service providers (physicians and consultants) residing in the Kingdom of Saudi Arabia.

**Chapter Three: Research Methodology**

This chapter includes a review of the study's methodology, its population, sample, the tool used, as well as the measures of its validity, reliability, and the statistical methods employed.

Research Methodology:

The study adopts a correlational survey methodology.

Population of the Study:

The population of the study comprises all patients receiving healthcare services, including citizens and residents of the Kingdom of Saudi Arabia.

Study Sample:

The researcher distributed the electronic questionnaire to a sample of healthcare service recipients, consisting of citizens and residents in King Fahd Medical City. The sample size was 250 individuals, and the number of respondents was 100 individuals, representing a response rate of 40%.

Study Tool:

The survey questionnaire.

Validity and Reliability of the Survey:

Reliability of the Study Tool:

The reliability of the tool was ensured using the internal consistency coefficient, measured by Cronbach's Alpha. Table (A) illustrates the reliability coefficients of the questionnaire dimensions and the questionnaire as a whole

**Table (A) Reliability Coefficients of the Questionnaire Dimensions and Overall Questionnaire**

The dimensions and their internal consistency coefficients are as follows:	The internal consistency coefficients are as follows:
Capability of Telemedicine to Support Healthcare Quality:	0.92
Impact of Telemedicine on Healthcare Service Distribution:	0.89
Opportunities and Challenges Facing the Implementation of Telemedicine Policy:	0.85
Total Score:	0.86

The Table (A) indicates that the internal consistency coefficients of the dimensions and the scale are good, and these reliability coefficients are acceptable.

The reliability of the indicators

Pearson correlation coefficient was calculated between the items and the dimensions, as well as between the items and the total score, and Table (B) illustrates this.

**Table (B) Correlation coefficient of items with dimensions and total score.**

		The first dimension	Total score			The first dimension	Total score
1	Correlation	.718**	.622**	9	Correlation	.757**	.653**
2	Correlation	.757**	.642**	10	Correlation	.856**	.693**
3	Correlation	.659**	.566**	11	Correlation	.847**	.703**
4	Correlation	.777**	.698**	12	Correlation	.319**	.602**
5	Correlation	.814**	.738**	13	Correlation	.635**	.558**
6	Correlation	.773**	.634**	14	Correlation	.656**	.520**
7	Correlation	.751**	.675**	15	Correlation	.791**	.559**
8	Correlation	.560**	.675**	16	Correlation	.658**	.525**

Table (B) demonstrates that all correlation coefficients were statistically significant; therefore, no item was deleted.

**Chapter Four: Presentation and Discussion of Results**

Results of the First Dimension:

Distribution of the study sample according to the variables.

	Variables	Number	Percentage	Total
<b>Gender</b>	<b>Male</b>	65	65.0	100
	<b>Female</b>	35	35.0	
	<b>Total</b>	100	100.0	
<b>Age Group</b>	<b>20 to 30 years</b>	23	23.0	
	<b>31 to 40 years</b>	41	41.0	
	<b>41 to 50 years</b>	29	29.0	
	<b>Over 51 years</b>	7	7.0	
	<b>Total</b>	100	100.0	
<b>Education Level</b>	<b>Less than High School</b>	7	7.0	
	<b>High School</b>	11	11.0	
	<b>University</b>	53	53.0	
	<b>Postgraduate Studies</b>	29	29.0	
	<b>Total</b>	100	100.0	
<b>Place of Residence</b>	<b>Village</b>	6	6.0	
	<b>Province</b>	20	20.0	
	<b>City</b>	74	74.0	
	<b>Total</b>	100	100.0	

**Statistical Procedures:**

To answer the first, second, and third questions, mean values and standard deviations were used.

Pearson correlation coefficient was used to answer the fourth question.

Study Tool Correction: The following standard was used:

Low level: less than ( $1.33 + 1 = 2.33$ )

Medium level: from ( $1.33 + 2.34 = 3.67$ )

High level: (3.68 or more).

Results Related to the First Question: What is the extent of the Medical Advocacy's ability to support healthcare quality?

**Table (1)** displays the mean values, standard deviations, and ranks for assessing the extent of Medical Advocacy's ability to support healthcare quality, arranged in descending order based on the mean values

Field	Mean	Standard Deviation	Rank	Grade
Telemedicine affects reducing the burden of travel on patients between cities to access treatment.	4.23	.737	1	High
Telemedicine affects the development of the healthcare system in light of pandemics that necessitate remote communication.	4.19	.748	2	High
Telemedicine affects reducing the financial cost on the patient.	4.18	.702	3	High
Telemedicine affects facilitating access to service without the hassle of waiting.	4.14	.725	4	High
Telemedicine affects monitoring medical cases from home.	4.08	.646	5	High
Telemedicine affects saving the patient's time in obtaining information from specialists.	4.06	.708	6	High
Telemedicine affects the ability to continuously access the patient's medical consultation.	3.96	.724	7	High
Overall.	4.12	0.536	High	

From the results of Table (1), it is evident that the arithmetic means of the estimates of the extent to which telemedicine can support healthcare quality ranged between (4.23-3.96). The statement "Telemedicine affects reducing the burden of travel on patients between cities to access treatment" ranked first, with an arithmetic mean of (4.23), and a high degree. While the statement "Telemedicine affects the ability to continuously access the patient's medical consultation" ranked last, with an arithmetic mean of (3.96), and a high degree.

**Results related to the second question: To what extent does telemedicine influence the distribution of health services in the Kingdom?**

Arithmetic means, standard deviations, and ranks were calculated, and Table (2) shows the results as follows:

**Table (2)**

Arithmetic averages, standard deviations, and ranks for estimates of the extent of the impact of telemedicine on the distribution of health services in the Kingdom, arranged in descending order according to the arithmetic averages.

Field	Arithmetic averages	standard deviations	Rank	Grade
Telemedicine shall impact access to quality health care for people living in rural and remote areas.	4.18	.730	1	High
Telemedicine shall impact the knowledge of environments in which the type of health services provided in them need to be improved.	4.15	.657	2	High
Telemedicine shall impact justice and equality in access to health care services at the same level for all citizens and residents in various regions of the Kingdom.	4.15	.730	3	High
Telemedicine shall impact the identification of areas where health services are properly provided within the Kingdom.	4.02	.724	4	High
Total	4.13	.566		High

The results of Table (2) demonstrate that the arithmetic averages of estimates of the extent of the impact of telemedicine on the distribution of health services in the Kingdom ranged between (4.18-4.02); The paragraph states: "Telecommunication medicine shall impact the availability of distinguished health care for people living in rural and remote areas." In first rank, with an average of (4.18), and a high degree, while the paragraph states that "telecommunication medicine shall impact the identification of the areas in which health services are properly provided within the Kingdom" In last rank, with an average of (4.02), with a high degree

**Results related to the question3: What are the opportunities and challenges facing the implementation of telemedicine policy?**

Arithmetic average, standard deviations, and ranks were calculated, and Table (3) shows the results as follows:

**Table (3)**

Arithmetic means, standard deviations, and ranks for estimates of opportunities and challenges facing a policy for implementing telemedicine to facilitate work processes, arranged in descending order according to the arithmetic means.

Field	Arithmetic averages	standard deviations	Rank	Grade
Lack of present diagnostic examination, which may hinder accurate diagnosis.	4.05	.783	1	High
Ignoring previous information about the patient's medical history	3.99	.689	2	High
The need for larger numbers of available medical personnel	3.98	.765	3	High
Patient's lack of faith in remote medical diagnosis	3.95	.730	4	High
Failure to coordinate treatment with the patient's usual physician.	3.93	.685	5	High
The virtual environment may be a factor of hesitation for patients to trust	3.92	.706	6	High
Total	3.97	.513		High

The results of Table (3) demonstrate that the arithmetic averages of the estimates of opportunities and challenges facing the policy of implementing communication medicine ranged between (4.05-3.92); The paragraph states: "The lack of present diagnostic examination, which may hinder accurate diagnosis." In first rank, with an arithmetical average of (4.05), with a high degree, While the paragraph stated, "The virtual environment may be a hesitation factor for patients in terms of trusting it" In last rank, with a mean of (3.92), with a high degree.

#### Results related to the main question 4: What is the impact of the telemedicine policy in supporting the quality of health care and the distribution of health services in the Kingdom?

The Pearson correlation was calculated to determine the impact of the telemedicine policy in supporting the quality of health care and the distribution of health services in the Kingdom, and Table (5) shows the results as follows:

**Table (5)** Pearson correlation coefficient

		Remote application policy in supporting quality health care	Distribution of health services
Remote application policy in supporting quality health care	<b>Pearson correlation coefficient</b>	<b>1</b>	<b>0.435*</b>
	<b>Statistical significance</b>		<b>0.002</b>
Distribution of health services	<b>Pearson correlation coefficient</b>	<b>0.369*</b>	<b>1</b>
	<b>Statistical significance</b>	<b>0.04</b>	

The results of Table (5) demonstrate that there is a positive correlation between the telemedicine policy in supporting the quality of health care and the distribution of health services in the Kingdom.

#### Chapter 5: Results and recommendations

This chapter shall present the results of the study in detail, as reached by the researcher after conducting statistical analysis of the data that the researcher obtained from the research sample, and then provide practical recommendations based on the results reached so that these recommendations contribute to treating the problems and defects facing the application of remote telemedicine in our Kingdom as possible to develop the health work system.

##### Chapter 1: results

- The arithmetic averages of estimates of the extent of communication medicine's ability to support quality health care ranged between (4.23-3.96); The paragraph that states, "Communicative medicine reduces the burden of movement on the patient between cities to obtain treatment," came in first place, with a mean of (4.23), and a high degree. This indicates that the study sample agrees that communication medicine is capable of supporting the quality of health care. While the paragraph states: "Communication medicine affects the ability to obtain medical advice for the patient on an ongoing basis." It ranked last, with a mean of (3.96), and this indicates the weak agreement of the study sample on the effect of telemedicine on obtaining continuous medical advice for the patient.
- The arithmetic averages for estimates of the extent of the impact of telemedicine on the distribution of health services in the Kingdom ranged between (4.18-4.02); The paragraph states: "Telecommunication medicine affects the availability of distinguished health care for people living in rural and remote areas." In first place, with a mean of (4.18), and a high degree. This indicates the strong agreement of the study sample on the impact of telemedicine on the issue of distributing health services within the regions of the Kingdom, while the paragraph that states "telemedicine affects the identification of areas in which health services are properly provided within the Kingdom." It ranked last, with a mean of (4.02), and this reflects the sample's weak agreement on the impact of telemedicine on identifying areas where health services are properly available within the Kingdom.
- The arithmetic averages of the estimates of opportunities and challenges facing the policy of implementing communication medicine ranged between (4.05-3.92); the paragraph states: "The lack of present diagnostic examination, which may hinder accurate diagnosis." In first place, with an arithmetical average of (4.05), with a high degree. This reflects the agreement of the study sample in terms of the effect of telemedicine on hindering accurate diagnosis of the disease, while the paragraph stated: "The virtual environment may be a factor of hesitation for patients in terms of trusting it." It ranked last, with a mean of (3.92), and this indicates weak sample agreement on the impact of telemedicine on patients' confidence in the health services provided to them.
- There is a positive correlation between the telemedicine policy in supporting the quality of health care and the distribution of health services in the Kingdom.

##### Part 2: Recommendations

Based on the research results, the researcher recommends the following:

- The study recommends to the Saudi Ministry of Health the need to keep up with the provision of the best innovative technology and artificial intelligence solutions and services on a renewed and continuous basis in the field of promoting digital health and telemedicine as a standard approach for the work of various hospitals and health clinics in all regions of the Kingdom, given its positive impact on the continuous distribution of health services and the provision of accurate medical advice. Developing the work of the Ministry's Media Center to provide service recipients with all the technological updates that are being introduced to telemedicine technology to increase their confidence in obtaining sound, accurate, and continuous medical advice within all regions of the Kingdom.
- Continuously reviewing successful treatment cases carried out through telemedicine technology in front of service recipients, to increase their confidence in the ability of this technology to provide correct and accurate medical



diagnosis at high rates, provide good health care and obtain medical advice on an ongoing basis and in all regions of the Kingdom alike and for all service recipients. Regardless of where they are, encouraging citizens to share their successful experience by benefiting from telemedicine in terms of accurate diagnosis, receiving treatment, and medical review as well.

- The study recommends the necessity of providing workshops to educate citizens and residents about the advantages and importance of telemedicine technology and its impact on their health, providing guidance on how to use this technology for the purpose of increasing citizens' confidence in it and realizing its positive impact on their health, and enabling all citizens to exploit it in various regions of the Kingdom to increase their confidence in it, as well as clarifying The ability of the technology used and the application of artificial intelligence in communication medicine and its main role in obtaining an accurate medical diagnosis for patients to increase patients' confidence in this aspect in particular.
- Providing cooperation between health care service providers, including doctors and specialists, with many doctors from different specializations around the world to obtain medical advice and accurate medical diagnosis for special medical conditions, which increases the confidence of service recipients in the accuracy of the medical diagnosis provided to them through telemedicine technology.

Among the general recommendations presented by the researcher, which positively affect the research results:

- The study shall recommend developing and activating the mechanisms of telemedicine technology within all regions of the Kingdom of Saudi Arabia, and providing support to various medical institutions on an ongoing basis to spread the culture of telemedicine because of its positive effects on improving the quality of medical services.
- The recommend of the need to develop cooperation between the Ministry of Communications and Saudi Health to employ the latest technologies of the fourth industrial revolution and the fifth generation to meet the needs of patients and support medical decisions in the future to a greater extent, proactively monitor the condition of patients remotely and provide preventive health care, and provide the possibility of applying telemedicine for emergency cases as well, because of its advantages. It has a positive impact on the public Involving service recipients in the process of improving and developing telemedicine services by receiving feedback from them after obtaining the health care provided through telemedicine technology by sending an electronic link after completing the service provision to ensure the recipient's satisfaction and their comments to develop the service and take them into consideration It is possible to send a monthly questionnaire to know the opinions of service recipients to develop the work of telemedicine technology.
- The study recommends the necessity of establishing a specialized committee to evaluate the quality of telemedicine services from the Saudi Healthcare Network to identify the weaknesses or negative aspects accompanying the provision of services and work to develop quick practical solutions to overcome them, which enhances the experience of citizens and service providers and their confidence in telemedicine.

## References

- Al-Kaffaji, Amal, (2018). Civil Liability for the Practice of a Telemedicine Service. Published on ResearchGate
- Website of the Saudi Ministry of Health, (2021). Website link: <https://www.moh.gov.sa/>
- Saudi Health Council website, (2020). Official website link: <https://shc.gov.sa/>
- Al-Awadhi (2020). The remote physician's obligations towards the patient. The Legal Journal. essay 8, Volume 8, Edit 11, Fall 2020, Page 3859-3884.
- Ahmed, Afnan Bint Faisal, (2015). Telemedicine. Faculty of Computer Science and Information Technology. Sudan University of Science and Technology
- Website of the Saudi Telehealth Network, (2020). Website link: <https://nhic.gov.sa/>
- Mounira, Jarboua, (2021). Telemedicine is a necessity imposed by the Corona pandemic. Algerian Journal of Legal and Political Sciences. Volume 58. Issue: 02. Year: 2021. Page: 127-.157.