Scientific Article Entitled: Telehealth Capability And Its Potential Options For The Performance Of Health Personnel In The Government Health Sector In The Kingdom Of Saudi Arabia

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Summary

While telemedicine has emerged as a primary means of providing allied health services globally, many practitioners lack the necessary skills to provide high-quality telehealth services. The purpose of this research is to determine the abilities needed by allied health professionals to provide telehealth services in an efficient manner. In addition to being a fundamental component

of modern nursing education and practice, telehealth and telemedicine also have an impact on health staff practice and quality by promoting positive outcomes, seamless nursing care, and positive experiences through nurse-patient contact. Based on the analysis of these data, three major recommendations were made: further primary studies with a primary focus on telenursing; telehealth training; reskilling healthcare workers (HCWs) in KSA; and incorporating telehealth into the nursing curriculum. Telehealth continues to be a major paradigm shift in nursing practice overall and is a key component of modern nursing practice.

Keywords: Telehealth, health personnel, Saudi Arabia, Electronic health.

Introduction

The practice of providing medical care remotely through the use of information and communications technology (ICT) is known as telehealth, and it dates back to the early 1900s. Its widespread deployment was unsurprisingly constrained by the technological and financial obstacles associated with transferring pictures, audio, and video via fledgling telecommunications infrastructure, despite its early inception and potential. Therefore, it should come as no surprise that the original vision for telemedicine did not include using technology to address global health issues that beset communities with inadequate infrastructure and resources—exactly the same factors that prevented widespread adoption in developed countries. It is plausible to believe that inadequate finance, technical resources, and infrastructure continue to impede its global application in resource-poor environments (Kim & Zuckerman, 2019).

For many years, allied health professionals (AHPs) have relied on telehealth as a reliable approach to provide services. However, due to the COVID-19 pandemic, telehealth has become even more popular as a means of addressing service delivery issues. The provision of healthcare services via information and communication technologies for the diagnosis, treatment, and prevention of illness and injury, as well as for research and evaluation, is referred to as "telehealth." Other names for telehealth include tele practice, tele delivery, and

telerehabilitation. It can also be referred to by more general words like eHealth or mHealth (Anil et al., 2022).

Telehealth offers numerous well-established advantages, such as enhanced accessibility to services for individuals residing in remote and rural locations, ease of use, and the elimination of obstacles related to travel and location. More service consumers are aware of and may be open to using telehealth as a means of service delivery now that they have had the chance to do so. It is probable that a large number of AHPs will carry on providing telehealth in addition to or in conjunction with in-person services as part of their regular practice. It is anticipated that in the upcoming years, telehealth usage and service scope will continue to change, especially with the introduction of new health technology (Anil et al., 2022).

Healthcare practitioners can primarily use quick and efficient electronic information and telecommunication technology to deliver remote clinical care, education, and health administration. Telehealth facilitates nursing procedures and allows nurses to provide care to clients who are located in remote locations all over the world. Doctors can communicate long-lasting patient data via telemedicine, which can be utilized to monitor the health of patients in isolated locations. Furthermore, it has allowed for the automation of the triage process in medical emergencies, which has decreased the time required to evaluate and divide patients into several categories based on the severity of their conditions (Napi et al., 2019).

This allows medical professionals to focus their rescue efforts by attending to the sickest individuals first. Technology has changed nursing by making patient data more accessible, lowering the possibility of human error, and lowering the burnout brought on by a scarcity of nurses. Telehealth decreases appointment delays, travel time required for referrals, transportation expenses, and time away from work, all of which contribute to increased patient satisfaction (Haider et al., 2020).

The success of telehealth in specialist care is well documented in the literature, which has encouraged the use of technology to give care and send health data in the context of mainstream healthcare. The main objective was to gather all telehealth research studies to

determine the state of telehealth innovation and research in the region. The investigation concentrated on the advantages of telehealth for the federal government, the implementation and satisfaction with electronic health records, the use of digital technology in medical education, novel systems, information security, and private health records. The study claims that Saudi Arabia has a robust medical information system culture that covers all telehealth domains (Al Baalharith et al., 2022)

Study Problem

Telehealth capability and its potential options for the performance of health personnel in the government health sector in the Kingdom of Saudi Arabia

Study questions

1-What is the effect of Telehealth capability on health sector?

2-What is the effect of electronic health on health sector?

3-What is the effect of digital health on health sector?

Study objectives

1-To detect the effect of Telehealth capability on health sector.

2-To know the effect of electronic health on health sector.

3-To detect the effect of digital health on health sector.

Study limitations

1-Geographical limits: The study will be applied in the Kingdom of Saudi Arabia.

2-Time limits: The study will be implemented in 2022.

3-Human limits: The study will be applied to a sample of health personnel in the government health sector in the Kingdom of Saudi Arabia.

4-Subject limits: limited to studying the Telehealth capability and its potential options for the performance of health personnel in the government health sector in the Kingdom of Saudi Arabia.

Literature Review

Patients with limited access to medical services can benefit greatly from telehealth's major improvements in health care delivery. In fact, telehealth initiatives can affordably serve a portion of the million individuals who do not have access to quality medical care by offering treatments ranging from dermatology to radiology. It is anticipated that in developing nations, there will be a shortage of health professionals, particularly experts, thus in the near future, low- and middle-income nations must employ innovative strategies to increase access (Kim & Zuckerman, 2019).

Telehealth can also be used by developing countries to strengthen their underfunded and ineffective public health systems. These systemic problems are frequently multi-sectoral, deeply ingrained, and the result of inadequate information systems, inadequate supply chains, subpar human resource management, and shaky funding sources. Initiatives in the telehealth field may be able to replace these industries with dependable and affordable alternatives. While there can be worries that telemedicine needs a well-established infrastructure and technology resources in order to carry out these kinds of system-wide tasks, these are frequently only perceptions.

In reality, even with constrained funding, telehealth apps can boost the organizational and operational effectiveness of current systems, lowering costs associated with medical treatment and enhancing patient outcomes. Telemedicine presents a viable way to control expenses while successfully carrying out essential public health tasks (Kim & Zuckerman, 2019).

Most people did not have many options to receive telehealth services, even if they wanted to, because of the billing and insurance coverage issues that came with using it. Telehealth was mostly used by patients who were hospitalized or lived in remote places. According to one study, one of the things preventing telehealth from being used is reimbursement issues (Zhang et al., 2021).

Applications for telehealth not only enhance healthcare systems but also build a global health network that is linked and capable of responding to humanitarian emergencies. Programs that are reliable and inexpensive can monitor and record medical situations, producing health data that is used to guide foreign aid initiatives and policy. The demand for both finance for

international emergencies and an integrated network of data exchange can be met via telemedicine (Kim & Zuckerman, 2019).

The primary source of accurate and trustworthy health information for the Saudi people is considered to be the Ministry of Health (MOH), which is the primary healthcare provider in the Kingdom of Saudi Arabia. The Ministry of Defense, academic medical centers, and the commercial sector are other avenues for the supply of healthcare. In a same vein, both citizens and foreigners can receive medical care in tertiary, secondary, and primary care facilities. The Saudi MOH adopted a goal in 2011 to employ information technology and electronic communication to raise the standards, equity, accessibility, and quality of healthcare in the Kingdom of Saudi Arabia (Hassounah et al., 2020).

The goals of the 2018–2020 Vision 2030 National Transformation Program health care strategic objectives were to improve quality, encourage risk prevention, and expand access to care. The National Health Information Center is tasked with developing multisectoral coherent eHealth services because it emphasizes eHealth as a crucial enabler of the health care reform. In the course of the previously described nationwide efforts to stop the spread of COVID-19, the Saudi Arabian government and the private health care industry both developed new and activated digital health solutions (Hassounah et al., 2020).

When it came to tele pharmacy, the MOH and other tertiary healthcare institutes either set up tele pharmacy services or used courier services to deliver prescriptions to patients' homes. In addition, the MOH collaborated with private sector pharmacies to send SMS text reminders to all health care practitioners who have an active professional registration to utilize its electronic prescription (e-prescription) services. One such is the Anat smartphone app, which lets licensed and accredited healthcare professionals electronically prescribe drugs to patients directly (Hassounah et al., 2020).

Electronic learning

In the Kingdom, electronic learning, or e-learning, is nothing new. The World Wide Web and the advancement of computer technology provided strong assistance for Saudi Arabia's education

system throughout its first ten years (1990–2000). Saudi Arabia launched a comprehensive e-learning platform for schools in 2002, complete with customized electronic lessons. In the years that followed, e-learning was improved and expanded in cooperation with foreign partners. The National Center for e-Learning was founded by the Ministry of Education (MOE) in 2017 as a part of Vision 2030. In Saudi Arabia, eLearning is overseen and supported by this center. The ongoing COVID-19 pandemic presents significant obstacles to ensuring the uninterrupted provision of educational services throughout the Kingdom. The lack of a standardized and cohesive approach to eLearning and the fact that patient interactions are essential to instructional approaches made this difficulty particularly apparent in the health education industry (Hassounah et al., 2020).

Electronic health

The phrase "e-health," which refers to any kind of electronic or digital procedure in healthcare, is relatively new and is sometimes used synonymously with "health informatics." All electronic healthcare delivered through information and communication technology channels is referred to as e-health. This includes direct services provided by healthcare professionals, organizations, and individuals as well as commercial, instructional, and informative services. To put it simply, e-health improves healthcare efficiency by enabling professionals and patients to access and handle data in previously unfeasible ways (Alsulame et al., 2016).

Telehealth and the use of technology

By using telehealth to exchange information over long distances, patients can change the rules. To guarantee proper patient assessment, real-time exchange of medical records—including imaging pictures, blood tests, and other data—is feasible. Telemedicine can lessen the congestion in emergency departments by requiring patients to first video chat with a doctor who is located elsewhere. Healthcare networks that have employed telemedicine technologies may witness to the fact that a significant time and financial commitment is necessary. Physicians, clinicians, practice managers, and others must be able to use the technology in order to reap its benefits. Despite telemedicine's initial high cost, healthcare organizations can realize a great return on investment over time with more patients

and less staff. Using this technology, physicians can evaluate a patient's medical background, administer clinical examinations, and more (Haleem et al., 2021).

The use of technology to transmit medical data from individuals located in different geographic locations is known as telemonitoring. Using electronic devices, this kind of monitoring enables doctors and other primary caregivers to follow patients. Additionally, patients can receive care at home thanks to telemonitoring equipment. They have more influence over how they are treated for their illnesses and fewer hospital visits as a result. Patients who live far away from hospitals or who lack access to telemedicine's inexpensive healthcare benefits cannot travel to hospitals. It can take a lot of time for them to act with other healthcare professionals on a daily basis. Through telemedicine, radiologists may gather high-quality images and get feedback from anywhere. They may now operate more efficiently because they are not need to be in the exact same place as the provider who is sending over the photographs. Probably one of the most popular telemedicine specialties are mental health services, which allow patients to get therapy sessions remotely (Leite et al., 2020)

Telehealth during Hajj Season versus COVID-19 in Saudi Arabia

In the past, Saudi Arabia's health authorities have been ready to handle any possible infectious illness outbreak linked to large crowds (such during the Hajj season). Research has indicated that travel-related diseases are primarily linked to this unavoidable congestion. With all the experience that has been accumulated over the years, the Saudi health officials are aware of how a population concentration can lead to a pandemic such as COVID-19. The fact that COVID-19 and the Hajj season coincide offers more evidence of the insights and advantages that TH could offer in terms of care delivery amid such a crisis. Due to the ease of access for both nationals and non-citizens, TH appears to be altering the way that care is provided in Saudi Arabia. As a result, it appears that TH can play a crucial role in the COVID-19 pandemic by reducing the chance of infection and assisting in leveling the development curve (Alghamdi et al., 2020).

Digital health

The use of information technology and electronic communication services, tools, and procedures to offer healthcare services and promote improved health is the emphasis of the newly-emerging field of digital health. The global healthcare system has been significantly impacted by the technological revolution. Furthermore, the global healthcare industry now has higher expectations for delivering high-quality services due to advancements in information and communication technology across all domains (Al-Kahtani et al., 2022).

Impact of digital technologies on consent

The permission process is impacted by the telehealth (and health) experience's growing digitalization. Because it is now unreasonable to read so many lines of text and technical jargon in order to fully consent to digital life, society as a whole has delegated the consent process to attorneys. It is standard practice to overlook consent information, whether they are signed in person or digitally, which undermines the significance, transparency, and patient literacy for a meaningful consenting process (Phuong et al., 2022).

From the perspective of public health and health capability, Saudi Arabia's health officials are ready to address the possibility of infectious diseases linked to large gatherings—like the Hajj season—spreading. They currently carry out the disease management plan of the Ministry of Health (MOH). This approach is in line with Saudi Vision 2030, which emphasizes the need to establish a national telehealth network in order to increase access to healthcare services throughout the country. The Saudi MOH offered numerous telehealth mobile applications to trackCOVID-19 patients, detect suspected cases, and give long-distance therapy (Alzahrani et al., 2022)

Aim of the study:

To detect telehealth capability and its potential options for the performance of health personnel in the government health sector in the Kingdom of Saudi Arabia.

Methods

Research design:

In the Kingdom of Saudi Arabia, a descriptive analytic cross-sectional research design was conducted with the purpose of identifying the capabilities of telehealth and the potential alternatives it presents for the performance of health staff working in the government health sector. This design is a method that is both systematic and organized, and it is used to gather data from a sample of individuals or entities that are part of a larger population. The major objective of this design is to provide a comprehensive and accurate description of the characteristics, behaviors, perspectives, or attitudes that are present within the target group.

Research Setting:

The study will be conducted in in the government health sector in the Kingdom of Saudi Arabia.

Subject:

A sample of 800 health cadres selected for a specific purpose, Those health cadres who are employed in the government health sector in the Kingdom of Saudi Arabia, both male and female, will be required to meet specific inclusion criteria in order to be considered for inclusion in the sample.

Sample size:

Study sample was 800 of health cadres selected via the systematic random sampling method.

When conducting an empirical research with the purpose of drawing conclusions about a population based on a sample, the size of the sample is an essential component to consider. In actual fact, the sample size that is used in an investigation is established by taking into consideration the cost of data collection as well as the need to have enough statistical power.

Inclusion Criteria:

The inclusion criteria were set as follows:

(1) health cadres who working in the government health sector in the Kingdom of Saudi Arabia.

(2) female and male.

(3) from Saudi Arabia.

Sampling Technique:

Participants submitted data through a survey. Data will be collected by questionnaire.

Tools for data collection:

It will deal with Participants demographic such like age, gender, marital status and educational level. Also issues concerning telehealth capabilities and its possible choices for the performance of health staff in the government health sector in the Kingdom of Saudi Arabia.

Validity:

The revision of the tools was ascertained by a panel of experts to assess the content validity of the tools and the required modification was done appropriately.

Ethical considerations

Data was submitted by individuals via questionnaires. Participants were notified that participation in the research would be elective and that their anonymity would be preserved. Data will be acquired using a self-reported questionnaire. The ethics committee will offer clearance for this initiative. Before the questionnaire was conducted, each participant supplied signed informed consent.

Results

Validity and Reliability Tests:

Internal Consistency Reliability Calculation:

After determining the legitimacy of the internal consistency between the statements of each objective and the overall score for the corresponding axis, Pearson's Coefficient Correlation was computed in order to validate the validity of the statement. Following the construction of the research instrument and the establishment of its apparent validity by the presentation of the instrument to a panel of arbitrators who were both knowledgeable and experienced in the area, this step was taken.

For the purpose of determining whether or not the questionnaire has an internal reliability, it was administered to a pilot sample that

consisted of thirty members of the healthcare staff. After that, the researchers determined the correlation coefficients in order to assess the internal validity of the research instrument, as the tables that follow demonstrate:

Table (1): Correlation coefficients of items in the first axis with the total score.

Statement number	r	Statement number	r
1	0.496**	7	0.757**
2	0.868**	8	0.456**
3	0.632**	9	0.721**
4	0.646**	10	0.301**
5	0.891**	11	0.759**
6	0.654**		

****: p value <0.001**

It is clear from the previous table that all of the statements are significant at the 0.01 level, as the values of the dimensional correlation coefficients ranged between (0.301 - 0.891), which are excellent correlation coefficients, and this offers a hint of strong internal consistency coefficients as well. It provides strong validity indications that may be relied in utilizing the present research technique.

Reliability of the study tool:

As for testing the reliability of the questionnaire, we utilized Cronbach's alpha coefficient, and the accompanying table illustrates the reliability axis of the research instrument as follows:

Table (2): Cronbach's alpha coefficient reliability coefficient for the total score of the questionnaire

	No. of statements	Cronbach's alpha
comprehensive quality standards questionnaire	11	0.856

The table showed that the Cronbach's alpha reliability coefficient for the total score of the questionnaire was (0.856), which is a good reliability coefficient suitable for the study.

Application Method of the Study Tool:

After collecting the study data, the researchers reviewed it in preparation for inputting it into the computer for statistical analysis. Subsequently, they transcribed it onto appropriate tables, provided commentary, and linked it to previous studies. Responses were given five levels: strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point). To determine the length of the pentavalent scale cells used in the study Phrases, the range (5-1=4) was calculated and divided by the number of questionnaire cells to obtain the correct cell length (4/5=0.80). This value was then added to the lowest value on the scale (or the beginning of the scale, which is one) to determine the upper limit of the cell. The following table illustrates the method for correcting the Likert pentavalent scale.

Table (3): Method for correcting the scale.

Scale	The weight	The average arithmetic mean value ranges
Strongly Disagree	1	From 1 to less than 1.80
Disagree	2	From 1.81 to less than 2.60
Neutral	3	From 2.61 to less than 3.40
Agree	4	From 3.41 to 4.20
Strongly agree	5	From 4.21 to 5.

Table (4): Socio demographic characteristics of the studied participants

Sociodemographic variables	Cases (n=500)	
	No.	%
Age category (years)		
Less than 25 years	100	20%
From 26 to 35 years	120	24%
From 36 to 47 years	90	18%
More than 47 years	190	38%
Gander		
Male	300	60%

Female	200	40%
Marital status		
single	180	36%
married	160	32%
absolute	158	31.6%
Job		
doctor	50	10%
pharmaceutical	40	8%
specialist	180	36%
Technical	130	26%
nurse	65	13%
Administrative	35	7%
Educational status		
Diploma or less	160	32%
Bachelor's	200	40%
Postgraduate studies (PhD - Master)	140	28%
Years of experience		
1 – 5 years	130	26%
6 – 10 years	120	24%
11 - 15 years	140	28%
16 – 25 years	110	22%

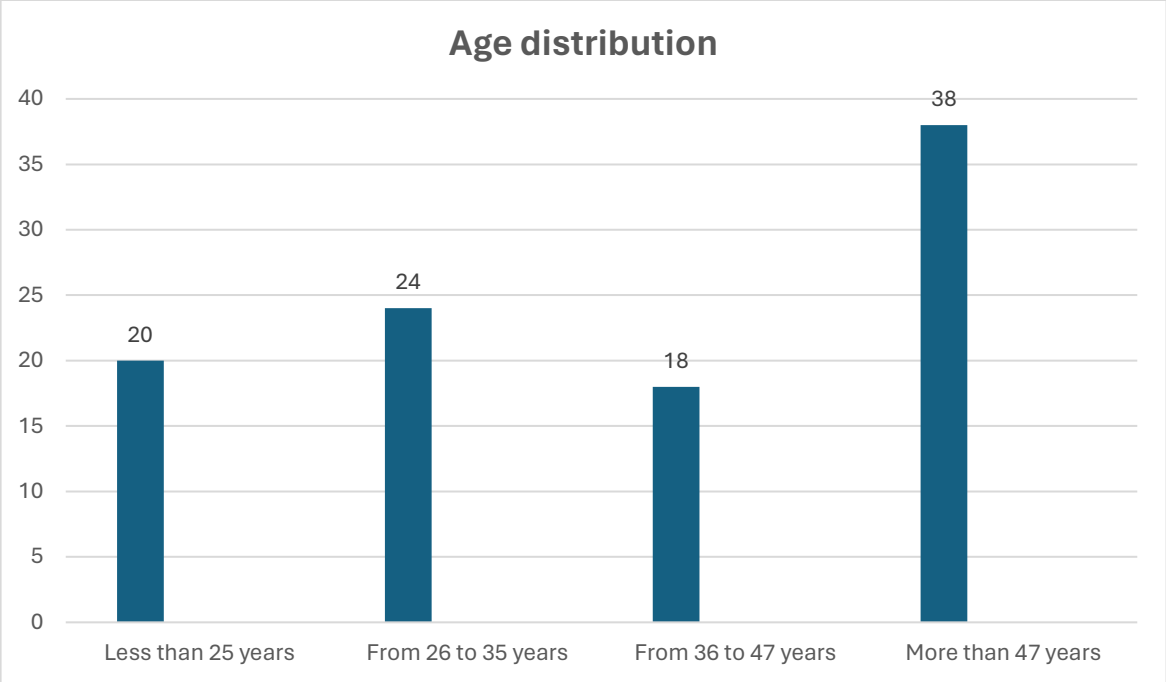

Fig (1): Age distribution among the studied participants

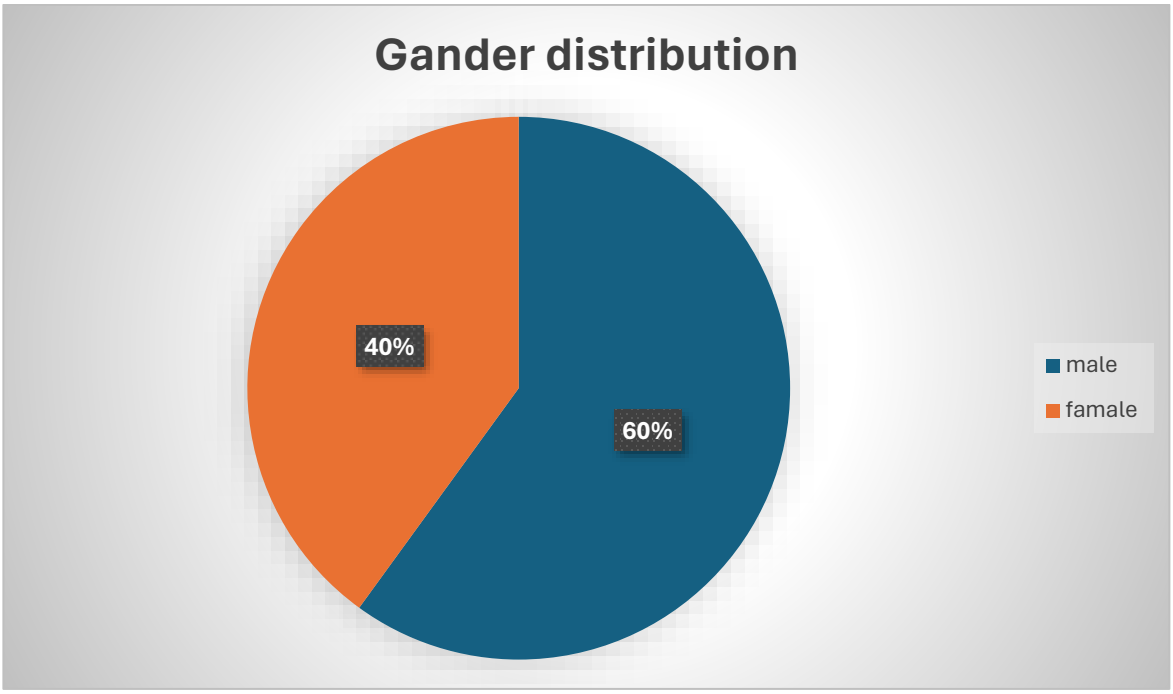

Fig (2): gander distribution among the studied participants

Table (1) & Figure (1-3) showed that 18% and 24% of the studied participants were aged 36 -47 years and 26-35 years respectively. Regarding to the gander, more than half (60%) were males and 40% were females. 36% of the studied participants were specialist while only %26 was Technical. As regard to years of experience, 24% of the studied participants worked from 6 – 10 years.

Secondly: Results Related to the Axes of the Questionnaire:

Table (5): response of the studied participants regarding to the first axe (telehealth) of Questionnaire

No.		Cases (n=500)			
		Mean	SD	Category	Rank
1-	Are you familiar with the concept of telehealth?	4.23	0.865	**Strongly agree**	**3**
2-	Have you received any training or education on telehealth technologies and practices?	3.58	0.824	**Agree**	**7**
3-	How would you rate your current understanding of telehealth services?	3.75	0.722	**Agree**	**6**
4-	Has your organization implemented any telehealth services?	4.11	0.67	**Agree**	**5**
5-	How do you assess the usability and effectiveness of these tools for delivering healthcare services remotely?	4.52	0.865	**Strongly agree**	**1**
6-	Are there any specific features or functionalities you believe are crucial for telehealth platforms in the Saudi Arabian context?	4.26	0.758	**Strongly agree**	**2**
7-	How do you think telehealth could improve access to healthcare for citizens, especially in remote or underserved	4.22	0.657	**Strongly agree**	**4**

	areas?				
8-	Are there any specific regulations or policies in Saudi Arabia that govern the practice of telehealth?	3.42	0.642	**Agree**	**8**
Total score		**3.93**	**0.788**	**Agree**	

From the results shown in Table (5), it is evident that there is variation in the agreement among the study participants regarding the comprehensive quality standards and the productivity of health personnel in the government health sector in the Kingdom of Saudi Arabia. The participants' agreement averages ranged from (3.42 to 4.52), falling into the fourth and fifth category of the Likert scale, indicating agreement to strongly agreement with the study tool. This demonstrates consistency in agreement among the study participants regarding telehealth capability and its potential options for the performance of health personnel in the government health sector in the Kingdom of Saudi Arabia.

Phrase (5): How do you assess the usability and effectiveness of these tools for delivering healthcare services remotely? ranked first with an average agreement of (4.52)

Phrase (6): Are there any specific features or functionalities you believe are crucial for telehealth platforms in the Saudi Arabian context? ranked second with an average agreement of (4.26)

Phrase (1): Are you familiar with the concept of telehealth? Ranked third with an average agreement of (4.23)

Table (6): response of the studied participants regarding to the second axe (Telehealth Impact) of Questionnaire

No.		**Cases (n=500)**			
		Mean	**SD**	**Category**	**Rank**
1-	Have health personnel in your organization received adequate training and support to effectively utilize telehealth technologies?	4.132	0.699	**Agree**	**2**

2-	Ongoing support and professional development opportunities are provided to ensure the successful implementation of telehealth.	3.735	0.741	**Agree**	**3**
3-	Do you think patients in Saudi Arabia perceive telehealth services?	4.612	0.831	**Strongly Agree**	**1**
Total score		**4.31**	**0.821**	**Strongly agree**	

Phrase (3): Do you think patients in Saudi Arabia perceive telehealth services? ranked first with an average agreement of (4.612)

Phrase (1): Have health personnel in your organization received adequate training and support to effectively utilize telehealth technologies? ranked second with an average agreement of (4.132)

Phrase (2): Ongoing support and professional development opportunities are provided to ensure the successful implementation of telehealth. Ranked third with an average agreement of (3.735)

Discussion

Telehealth is a possible route for boosting healthcare delivery in the government health sector of Saudi Arabia. With the growing acceptance of telehealth technologies, health workers may exploit numerous choices to enhance their performance. This involves thorough training sessions to acquaint them with telehealth technology and procedures. Additionally, the implementation of user-friendly telemedicine systems may promote smooth communication between healthcare practitioners and patients, boosting accessibility and efficiency. Integrating remote monitoring systems allows health workers to remotely monitor patients' vital signs, allowing proactive intervention and individualized treatment. Collaborative care models further strengthen coordination among healthcare workers, enhancing patient outcomes (Hassounah et al., 2020).

However, problems such as governmental restraints, technical infrastructure limitations, and cultural considerations need to be addressed to fully realize the promise of telehealth in Saudi Arabia. Policy changes, infrastructural development, and public awareness campaigns are required to overcome these difficulties and stimulate broad use. By adopting telehealth and promoting cooperation among stakeholders, Saudi Arabia can establish a resilient healthcare system that emphasizes accessibility, efficiency, and patient-centered treatment, eventually improving health outcomes for its people (Napi et al., 2019).

Conclusion

With telehealth, health professionals can establish a communication channel with service users and foster a relationship. These elements support the provision of patient-centered care. Because of better patient outcomes and self-management, this component has enhanced the quality of healthcare. To be certain about the long-term consequences, more evidence of a higher caliber and a more stringent methodology are required. In Saudi Arabia, the adoption of technology for the provision of healthcare services is a noteworthy development. In Saudi Arabia, a number of application systems that offer medical services have recently been installed. This study examines how technology is now used in Saudi Arabian healthcare delivery, highlighting the effects on patients as well as any obstacles they may have encountered. As more knowledge about the advantages and disadvantages of using telehealth becomes available, there will be a growing demand for programs to improve telehealth benefits or use among patients. As COVID-19 spread, policymakers seemed to be responding to the uncertainty surrounding the impending pandemic. In light of our findings, authorities ought to consider extending these short-term telehealth measures in the event of a future pandemic. Authorities should think about enacting regulations that support the expansion of telehealth services, like specialized care, in order to better prepare people for unforeseen obstacles to in-person healthcare in the future. Given the potential advantages of telehealth services, governments ought to carry out further research before coming up with plans for handling unforeseen roadblocks that keep patients from receiving in-person care.

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