Telemedicine: Implementation, Challenges and Opportunities in the Global World

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Abstract: *Medical service is one of the most important policies, and every country's population requires adequate medical care. There are three major roadblocks that prohibit people from receiving good medical treatment and care. First, there is a shortage of medical personnel, particularly physicians, which occurs even in rich countries. Second, a key demographic issue, an increase in the number of people living in poverty, Finally, geographical component also plays a key impact in healthcare inequity. People who live in rural or isolated places have a hard time getting good medical care. Information and communication technology have evolved into a critical infrastructure upon which other areas can construct more effective solutions. Integrating such technologies into the medical field is a huge step forward. As a result, telemedicine is now available all over the world. Based on existing studies and implementations, this article analyses telemedicine in three important aspects: current state, obstacles, and potential.*

Introduction

One of humanity's greatest difficulties in the twenty-first century is making high-quality health care available to all. This goal will be difficult, if not impossible, to achieve due to the limits imposed on a growing world population by old and new diseases, rising demands for health, and socioeconomic factors that have, if anything, exacerbated gaps in health status between and within countries. The fact that both the provider and the recipient must be present at the same time and in the same place has always been a difficulty in ensuring equitable access to health care. Recent advancements in information and communication technologies, on the other hand, have expanded the variety of channels via which health care can be delivered, opening up great possibilities for overcoming this.

This applies to both emerging and developed countries that are weak or unstable. The potential for employing information and communication technology to improve healthcare delivery ('Health Telematics') is becoming more widely recognised. The WHO and its member states should integrate the appropriate use of health telematics in the overall policy and strategy for achieving health for all in the twenty-first century, thus fulfilling the vision of a world where the benefits of science, technology, and public health development are distributed equitably, according to the WHO. Those with the financial means to do so, such as participants in various European Commission programmes, are considering making such a commitment to use information and telecommunications technology to improve health-care delivery. At the national and subnational levels, there is also evidence of official interest in the benefits that these technologies may offer to health care. Information

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technology, particularly telemedicine, is at the heart of the government's effort to modernise and improve the National Health Service in the United Kingdom, for example. 3 As a result of this change, telemedicine, which integrates medicine, information, and telecommunications technology, is projected to have the largest impact on health-care delivery.

What is Telemedicine?

Telemedicine is the delivery of health care and the exchange of health-care information over large distances. Telemedicine is simply "medicine at a distance," as the prefix "tele" derives from the Greek term "at a distance." As such, it encompasses the complete range of medical activities, including disease diagnosis, treatment, and prevention, as well as continuing education, research, and assessment for health-care providers and consumers. Tele-care is a term that refers to providing nursing and community support to a patient across a long distance.

Tele-health, on the other hand, refers to the remote delivery of public health services to those who aren't sick but wish to be healthy and independent. Despite ongoing discussions regarding what defines telemedicine, telecare, and telehealth, and how they differ in practise, they all require the transfer of health-related data between one or more locations in order to enhance the health of individuals and communities. In other words, it is the data that is moved, not the providers or receivers of health-care services. Nowadays, using a telecommunications network to convey information is virtually always easier.

Health telematics is a broad term that refers to all health-related activities that are carried out across a long distance utilising information and communication technology. As a result, telemedicine, as a subset of health telematics, might be characterised as "rapid access to shared and remote medical knowledge via telecommunications and information technology, regardless of the patient's location or the information required."Telemedicine is the delivery of health care and the exchange of health-care information over large distances. Telemedicine is simply "medicine at a distance," as the prefix "tele" derives from the Greek term "at a distance." As such, it encompasses the complete range of medical activities, including disease diagnosis, treatment, and prevention, as well as continuing education, research, and assessment for health-care providers and consumers. Tele-care is a term that refers to providing nursing and community support to a patient across a long distance.

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Advantages of Telemedicine

Telemedicine has dramatically increased patient health-seeking behaviour and bridged the gap between doctors and patients. Both patients and doctors benefit from it.

Advantages for Patients

Lowering Costs

The interaction between patient and doctor on mobile phones and computer has lowered the medical costs and out of pocket expenditures as patients spend less time in the hospital. It has also lowered costs regarding transportation by saving money on fuel and public transportation.

Time Flexibility and Convenience

Telemedicine has saved time for people as they don't have to take time off from their work and travel to the hospital. People can have their doctor's appointment during a break or after office hours. They can maintain their health and wellbeing without missing a day at work. Their time travelling has been reduced as they can easily access their doctors through telemedicine at home without running to the hospital. They won't have to worry about reaching their appointments on time and getting stuck in traffic. Lastly telemedicine has also reduced waiting time for patients in hospitals as more people will be inclined towards seeing their doctor online.

Better Access to Healthcare

Telemedicine has provided easy access to healthcare for people with disabilities as they can avail healthcare at home. It has also improved accessed to people who are living in isolated area, older people and people who were incarcerated.

Putting an end to Childcare and Elder Problems

While visiting hospitals, patients who have to take care of children or elders as well, have to take them to the hospital. This is not always a feasible option. Leaving them at an alternative care is expensive and inconvenient. Telemedicine has enabled patients to access heath at home while taking care of their children and elders, altogether putting an end to these problems.

Access to Specialist

Sometimes patients need to avail the care of specialists who are not available in nearby hospitals and they have to travel long distances for every visit. Telemedicine has made it easier for patients to access these specialists without having to travel long distances. This has proved to be helpful in serious medical ailments and diseases where the consultation and expertise of specialist is required to solve the problems.

Less Chances of Catching a New Illness

Hospitals and doctors office carry the most amount of bacteria, viruses and germs. Especially in the era of Covid 19 where doctors wanted to lesser the interaction between patients to prevent corona virus infections. When people stay at home and use telemedicine to access health, they are lowering the probability of spreading infection to someone else. While going to the hospital will expose people to germs especially in crowded areas.

Improved Health and Health behavior

With the removal of hurdles in a physical visit to a hospital. Patients can put their health first without thinking as they can connect with their doctor online. They will see their doctor often this way and they will be able to manage their ailments much better this way. Consequently their health will improve and so will their health behavior.

Health Insurance not Required

In today's world people without proper health insurance face difficulties when going to the doctor. Online companies who have provided telemedicine through cash pay, removing the requirement for health insurance, have resolved this problem.

Access to People Living in Rural Areas

For people residing in rural areas, quick access to healthcare is not available. Telemedicine has provided quick and easy access of healthcare to those who live far away from hospitals and medical centers. This also saves time from travelling long distance and refrain people to go out in bad weather conditions.

Late night Healthcare for Babies and Children

Little ones tend to get sick quickly and often, sometimes it occurs late at night. Parents get worried and try to provide care to their child at home but they rely on internet searches to do so. Telemedicine eliminates the need to go to a hospital at a late hour and it also helps parents connect to doctors to get a proper diagnosis and consultation for their child. They can even prescribe medicine this way.

People with Chronic Conditions

Telemedicine has helped people with chronic conditions by transmitting readings to doctors by at home monitoring tools to keep a check on their health conditions and vital signs. This has proved to be lifesaving because it helps patients get fast interventions.

Psychiatric Care at Home

Telemedicine has allowed people to talk to their psychiatrist at home with the ongoing pandemic. They can continue their therapy online, it is especially helpful to people experiencing mental health issues like stress, anxiety and depression etc. They can contact their therapist in both daytime and nighttime in case of emergency. Online support groups led by therapist have helped people going through a tough time like PTSD, infertility or loss of a loved one, to come in a place where other people are facing the same challenges.

Online Physical Therapy

Physical therapist can also use telemedicine to connect with their patients and conduct physical therapy online. They can monitor and supervise their patient's recovery and progress by continuing physical therapy exercises using telemedicine. Patients will get immediate medical attention so they can regain their strength and heal.

Advantages for Doctors and Healthcare Providers

Doctors and healthcare providers are also benefitting from telemedicine when they are offering telemedicine services to their patients. Some of the benefits are:

Doctors and Therapists can Work from Home and Stay Safe

Doctors and therapist can offer consultations to their patients from home using telemedicine. This has proven to be helpful in this time of a pandemic when many hospitals and clinics have either reduced their time or are closed. Doctors and therapist can protect themselves from infection and still offer healthcare services to patients. Doctors and therapist can treat their patients from their home

offices on virtual private networks that are protected by cybersecurity companies. Patients can connect to their doctors after work hours and even on weekends. Doctors and therapist, who can't continue their job due to domestic reasons, can continue their job from home using telemedicine.

Expenses have been Reduced

Healthcare providers who are providing telemedicine can experience lesser number of overhead expenses. They will pay lesser amounts of money for furniture, office staff like assistants or receptionist or to maintain infrastructure of offices. They won't have to invest in large office space that means less amount of money will go towards rent and maintenance. Overall reduction in expenditure will be seen.

Increase in Revenue

Telemedicine will allow doctors and therapist to earn more as they can cater to the needs of more patients. This will generate more income for them as well as provide care to larger number of people.

Patients are Satisfied

Patients are satisfied because they have to wait to receive treatment and care from their doctors and healthcare providers. They also don't have to travel and get consultation at home.

Disadvantages of Telemedicine

Telemedicine is quite helpful in some cases but it is not applicable and helpful in all cases. Some of the disadvantages for patients and doctors are as follows:

Disadvantages for Patients

Insurance Coverage

Telemedicine is not covered and provided by all insurance companies. The laws regarding insurance coverage of telemedicine vary from state to state and are constantly changing in America. Insurance of telemedicine is required in 26 states of America so far.

Cyber Security Issues and Safeguarding Medical Data

hackers and cyber criminals can steal the medical data or record of patients, if the medical records are not properly encrypted or are available on a public network. Protecting medical records should be a priority to uphold confidentially of patient's personal information.

Delayed Care

In case of an emergency care like accidents when a patient would need to be operated on, telemedicine will cause delay in providing quick care and treatment to the patient as the doctor won't be able to perform lifesaving operation or treatment. The doctor can't get laboratory tests through telemedicine as well.

Hindrance in Specialized Care to Children

Children, who have learning disorders or need specialized care like speech therapy, will have a hard time concentrating on their progress and working with their therapists. Telemedicine will create a hindrance in this condition.

Disadvantages for Healthcare Providers

Licensing Issues

Doctors may not be allowed to practice medicine outside of their states in America, due to the variation in state laws of America. It depends on the state where they got their practitioner license and the state where the patient lives.

Technological Issues

While opting for telemedicine doctors should make sure they are using a secure, private and stable digital platform as well as a strong internet connection. This goes the same for patients availing telemedicine, they need proper connection. If they live in rural area they might face difficulty in finding a strong internet connection.

No Physical Examination of Patients

As doctors can't examine their patients physically and carry out tests, they will rely on the patient's self-reports during their consultation. The doctor will need to ask more in-depth question to ensure patient's health concerns are properly recorded. If any symptom is left out that could have been noticed during physical visits, it may hinder the treatment. For example doctors can't take blood tests, urine samples, use stethoscope to measure heart rate and breathing mammograms, pap smears, sonograms, and eye pressure exams for glaucoma.

Telemedicine in Pakistan

Pakistan is not unfamiliar with the concept of telemedicine. In Pakistan the healthcare delivery system was compromised in rural areas as health institutions and medical facilities are far away from them. With the introduction of telemedicine in Pakistan and its expansion in areas where medical services was not accessible, telemedicine industry in Pakistan aims to improve accessibility of health to rural areas and villages. The industry has gone through major developmental changes and it has improved tele-commuciation and connectivity in all parts of the country. TelMedPak was the first philanthropic telemedicine project in Pakistan which started back in 1998. It completed smaller projects in Gilgit and Taxila on experimental basis. The first project was in Ali Family hospital Taxila, this private hospital was connected to Holy Family hospital based in Rawalpindi through computer system, scanner and internet connection. Patients' health records were kept confidential. In Gilgit, a voice chat facility linked D.H.Q (Gilgit) to Holy Family Hospital Rawalpindi where medical images, x-rays and patient records were sent to the specialist in Holy Family Hospital to test out possible methods of telemedicine. In the public sector, the Government of Pakistan started initiatives for the development of telemedicine in Pakistan. The foundation of the telemedicine forum was initiated in September 2001. Health Management Information System (HIMS) and Health Resource Center (HIRC) were also developed in this time; it led to the creation of electronic patient record system in federal hospitals. After the 2005 earthquake in Pakistan, telemedicine centers were established in effected regions and the importance of telemedicine was greatly realized. The Government of Pakistan has made telemedicine and e-health crucial to restoring areas hit by the earthquake. SUPARCO has initiated the Pakistan's first satellite network that supports telemedicine and it has established three satellite based telemedicine centers in large cities with the support of Ministry of Information Technology. Pakistan's government has been working on starting a nationwide telemedicine network with the help of telemedicine and e-health training centers and by connecting medical college hospitals with district hospitals all over Pakistan. Electronic Government Directorate (EGD) had started a tele-health project in 2007 which included Mayo hospital, Holy

family hospital and Jinnah Post Graduate Medical Center. Agha Khan Health Services Pakistan initiated telemedicine services in Gilgit Baltistan in 2009.

Apart from these public initiatives, private organizations in Pakistan are also paving way for the advancement in telemedicine. Some of these private initiatives are mentioned below:

Tele Polyclinic

Dr Mujeeb Rehman from Sindh founds tele Polyclinic, he started this online initiative to improve healthcare delivery system and access to healthcare for basic health issues. It was launched on March 2018 through a website, android application and a facebook group. The app connects patients to doctors and medical practitioners, who analyze, diagnose and provide treatment to patients during online consultation. Over 3000 registered doctors, more than 300 specialists are delivering free of cost healthcare to their patients.

Sehat Kahani

Another effort co-founded by two female doctors, Sara Saeed Khurram and Iffat Zafar Aga, is Sehat Kahani, which was launched in 2017. It is a groundbreaking programme that has enabled female doctors who are unable to continue their careers to work from home and provide healthcare through online consultations. There are 1500 female doctors in the network, as well as 27 e-health clinics. It has teamed up with Umang, a 24-hour mental health service, to raise awareness about addiction.

Marham

Marham was co-founded byAsma Salman Omer and Farwa Ali. Marham started out as Facebook community group where health information was shared. As the community grew later on Marham expanded its services to website, mobile apps and call center. Doctors' information and reviews were shared on this platform which was easily accessible to patients who could book online appointments. 12,000 registered doctors are using this platform and they can manage their profiles and appointments as well as create medical records, prescriptions and interact with their patients.

Doct-Hers

Doct-HERS was co- founded by Dr Asher Hasan, Sabeen Fatima Haque and Dr Sara Khurram. This is another initiative which has utilized female doctors and specialists to efficiently provide healthcare that is accessible even through a smartphone.

Applications for Virtual Consultation

Virtual consultation between clinician and patient are increasing in the developed countries and is easily acceptable. These consultations offer advantage to both patients and doctors and are easily accessible. Virtual consultation is a solution to provide healthcare to a diverse range of population.

Applications
Skype

Skype (Estonian origin social platform) is use for video consultation between doctors and patients. According to a case study which was conducted in London, UK in 2004 to see the effects of virtual consultation on patients, was consist of in-depth qualitative studies. Some of the studies showed the effects of Skype in management of Chronic illnesses. On the one hand, Skype was used to deliver the in-person problem solving therapy for management of depression in participants specifically older household adults. these therapies were effective at reducing the depression in patients.

However, at 36-week follow-up, the patients who using skype showed better results than those in the in-person condition.

Doctor 2U

Malaysia developed this app in partnership with Microsoft that provide healthcare facilities at home. This app is accessible for both iPhone and Android users and individuals can consult with respective doctors via live chats and virtual consultations.

Doctor Chat

This medical app can be used by both patients and physicians. Individuals using this app can consult or interact with the medical professionals around the world. By using this app physician can also interact with other physicians to discuss cases that brought to them.

Live Health

This app keeps the individual's privacy and confidentiality by offering the login and sign in options. By signing up, he/she can choose a doctor and contact him/her for any health related issue via video chat.

MD Live

This app provides healthcare services at distance through digital platforms and telecommunication devices. Patients and physicians can communicate through phone calls, video chats and emails.

Teladoc

This is based in Dallas and Texas. This app provides patients with equal services to a face-to-face interaction with doctors via video conferencing and mobile phone. Through this app remote healthcare is provided to patients by using mobile devices, video conferencing and internet. Patients who are in need of medical services, can call teladoc to book for a virtual visit without making an appointment with a medical doctor.

Apps for Virtual Consultation in Pakistan

When it comes to the technology and medical care there are some apps working in Pakistan to provide patients with instant medical care. These apps are accessible to the individuals in Pakistan that help people to manage their health.

Mytabeeb.pk

This app was launched in January,2016 and has 1ooo+ installs. The idea behind this app was to get immediate medical care from accessible doctors everywhere in Pakistan. This app has 3000 doctors and 60 hospitals which are located in Karachi, Lahore, Islamabad, Rawalpindi and Peshawar. The availability of this app has made it easier for people to approach high quality care from available doctors everywhere and at any time without making an appointment.

Findmydoctor.pk

By using this app, you can get access to the available doctor and can make book an appointment whenever you want. This app is not only beneficial for patients but also for doctors who want to increase their outreach. Patients also can choose their doctor on the basis of reviews and make the right choice.

Ring MD

This is the Singapore based-company. It offers its online consultation services in many countries including Pakistan. By using this app, individual can make online video or audio calls with the respective doctors and this app can let you send direct or private messages to the doctor. This app is best for online consultation and can access your favorite doctor by paying the mentioned fee.

Increase in Telemedicine due to Pandemic

Telemedicine have been available for many years for patient's care but coverage of telemedicine was low due to inexperience with the technological used to perform telemedicine services. However, due to COVID-19 pandemic the use of telemedicine services increases in healthcare. Healthcare institutions around the globe altered both inpatient and outpatient services in order to utilize telemedicine.

Past

Clinicians have had access to telemedicine for many years, but it has not been widely adopted. According to statistics from Optum Labs Data Warehouse3 (Optum, Eden Prairie, Minnesota, USA), telemedicine use rose between 2005 and 2017, with use for mental health continuously increasing between 2016 and 2017, however it was not generally deployed. Telemedicine utilisation climbed to 76 percent in 2017 compared to 35 percent in 2010, according to a survey done by the American Hospital Association (AHA). There were several impediments to the use of telemedicine prior to the COVID-19 pandemic, such as staff training on new technology means, a lack of enthusiasm to train staff, and healthcare practitioners' inability to change their practises and learn new ways of providing healthcare services. Another stumbling block was that it could only be used or benefited individuals who lived in rural areas.

Present

Telemedicine has quickly become commonplace as a result of pandemics, and the COVID-19 pandemic has forced telemedicine into daily practise. Due to telemedicine, continuity of healthcare was guaranteed during the epidemic by maintaining social distance, and medical staff were able to manage the increasing patient load. More guidelines for telemedicine implementation in the COVID-19 pandemic have been published by healthcare societies. Telemedicine, for example, was utilised in China to educate healthcare practitioners about covid. The spread of Covid-19 has a significant impact on hospital workflow. During the global shortage, many measures were made to ensure that personal protective equipment (PPE) was maintained. Physicians at Baylor Scott & White All Saints Medical Center (Fort Worth, Texas, USA) began using telemedicine communication services to reach patients who tested positive for COVID-19 without admitting them to hospitals. Telemedicine was utilised to assess patients in the emergency department at University Rey Juan Carlos (Madrid, Spain) to decide which patients could be cared for virtually to minimise patient load and preserve resources. Many hospitals employed telemedicine for in-patient treatment to balance the availability of healthcare services with rising demand, with the goal of reducing the transmission of contagious viruses. Furthermore, patients who were isolated employed videoconferencing software to communicate with their loved ones.

Many students, doctors, pharmacists, and nurses had their training postponed due to the epidemic; nevertheless, telemedicine allowed these students to complete their education without putting themselves in danger. Tongji Hospital in Wuhan, China, employed telemedicine to monitor patients who were self-quarantining at their residences. Telemedicine services are also used in out-

patient settings, as opposed to in-patient settings. Duke University Health System (Durham, North Carolina, United States) had telemedicine protocols in place before to the epidemic, but they were not widely deployed. During the pandemic, Duke University Health System's telehealth visits climbed by up to 70%, with outpatient visits accounting for the majority. The Outpatient Rehabilitation Institute at IRCCS Istituto Ortopedico Galeazzi, Milan, Italy, transitioned all face-to-face visits to telemedicine visits on March 16, 2020, due to a drastic increase in COVID-19 pandemic complete lockdown was implemented in some Italian cities due to a drastic increase in COVID-19 pandemic complete lockdown was implemented in some Italian cities due to a drastic increase in COVID-19 pandemic complete lockdown was implemented in some

Telemedicine in Pakistan during Pandemic

Telemedicine has introduced in Pakistan after the earthquake of 2005 which had most dreadful impacts on Northern areas. Government launched some projects like Telemedicine Forum (2001) and a Telehealth Project (2007) in few hospitals t it was not widely accepted. By September 2020, Pakistan has recorded more than 451,000 Covid-19 cases_ resulting in over 9000 deaths. By keeping in view this situation, a country wide lockdown imposed in March 2020. During the pandemic, telemedicine act as a bridge between doctor and patient. In Pakistan, with the collective efforts of doctor's telemedicine in the form of Marham, Telepolyclinic, Medicall Health Solutions and Sehat Kahani played their vital role. The aim of these online platforms was to serve the country in better ways during pandemic. During pandemic polyclinic solved 70-80 cases per day and almost 100-150 cases through inbox messages, Polyclinic alone helped more than 50,000 patients during pandemic[i]. In Covid-19 situation, UNDP Pakistan has partnered with Sehat Kahani, which has almost 27 e-clinics across Pakistan and of great support to Pakistan Healthcare system during pandemic. Also a 24/7 helpline was launched to provide information related to covid-19. UNDP and Sehat Kahani also collaborated with Ministry of National Health Services, Regulation and Coordination in upgrading ICU's in Pakistan to tele-ICU's.

Pakistan, indeed has some successful telemedicine ventures like the Holy Family Hospital, the Agha Khan University Hospital, Sehat Kahani and Mehram but it lacks proper legislation and telemedicine policy. So, the first step should be that policymakers should pass the legislation and implementation of telemedicine in both rural and urban areas. Not only this but government should educate the individuals and create awareness related to telemedicine, so that, everyone can be able to use it, effectively.

Artificial Intelligence in Telemedicine

Artificial Intelligence seemed to make its pathway into various field some one of health. For efficient and quality health provision, tele-medicine and tele-health are working side by side for urban and rural areas. Artificial intelligence is technology used to commute and communicate information through robots giving them the substitute power of a human mind. Meaning now a robot can provide you the same technical care as a heath professional.

This will not only resolve the following problems.

Financial Issues and Per Capita Expenditure

Considering the budget, spend on health care every year. The maintenance of health facilities, doctors providing medicines, conducting experimental test can put up a hefty cost on the budget. This will resolve the issue of not only the health cost as the software will be much long running and efficient in terms of money and reduces the economic burden on the state .

Time Efficiency

The use of technology will minimize time and more efficient **in terms** of quality provided. Then this will also save the time of the health professional thus minimizing the time and the data would be available at one touch.

Data Management and Availability

The data is availability is much easier and accessible at all times for use. The doctor can feed the data in the AI programmed device and use when required

Ease of Access

The ease of access in to the patient and doctor . The availability of professional health advice would be 24 hours. Also the problem of long distances will be solved . The rural or urban areas which do not have the access to state of the art health care facilities will be available to people .

Fewer Burdens

 The health professional will take less time for consultation thus will be able to treat more patients.

Western Examples

United States of America

Telehealth Network Grant Program (TNGP) Telehealth Network Grant P

This programme emphasizes on the usage tele-health programmes availability to improve healthcare services all across the country. It is catering the needs of rural urban and frontline areas. The main purpose behind these programs is to spread a quality healthcare with minimized variability of available services to the every region, quality training to doctors and improve health care to citizen all across the country.

The purpose of this programme currently is to provide tele-health emergency services via the availability of specialized para-medical staff 24 hours services online in rural areas.

Regional-Telehealth Resource Center Program (RTRC)

The purpose of this programme is to provide state of the art telehealth technical assistance across the country. There are a total of twelve total grant facilities available in the country speared out geographically in the country.

Their aim is to provide:

1. Training and support programmes
2. Decipher research findings along with information
3. Promoting efficient and quality assured services all across the country
4. Foster and other healthcare settings are being utilized in providing medicinal and healthcare services in the country
5. Assessing the broadband accessibility in rural areas to make the availability better. Similar programmes are also happening in Canada and China

Government Funding

The weight of the global pandemic is functionally crippling an already struggling health care system in Pakistan. Hospitals established in cities are overburdened, but nothing compares to the deficiencies

in resources in rural hospitals. Some of these hospitals are ghost units with no shows of health practitioners and a severe shortage of female medical staff. Despite the country's females outperforming their male counterparts in medical college admissions, few continue to practice after marriage. These social realities widen the health administration gap when many female patients prefer to consult a female practitioner for socio-religious reasons, particularly in rural areas that are often more conservative.

Pakistan indeed has some successful telemedicine ventures (e.g., the Holy Family Hospital, the Agha Khan University Hospital, SehatKahani, and Marham), but it lacks a telemedicine policy. Therefore, as a first step, policymakers should pass legislation to help advance the use and implementation of telemedicine in health care for both rural and urban populations. Furthermore, government officials should educate the masses and spread awareness about telemedicine systems among them by using communication tools. Finally, proper usage and protection of medical records should also be made a priority while establishing these new systems.

In developing countries like Pakistan, telemedicine is a relatively new concept. While one finds the government making efforts here and there in this sector, most of the initiatives are managed by NGOs. One such NGO that provides telehealth facilities in the country is Transparent Hands.

Transparent Hands is Pakistan's largest technical crowd-funding platform in the healthcare sector. It provides a comprehensive spectrum of free healthcare services to Pakistan's disadvantaged population, including medical and surgical procedures, medical camps, and telemedicine services. The platform gives underserved patients a voice and fosters a personal and trusting relationship between patients and donors while maintaining complete openness. It also organises free medical camps in Pakistan's rural areas, where worthy patients can receive free medical consultations, drugs, and diagnostic tests. Donors from all across the world can donate using the Transparent Hands crowd fundraising online page, which uses 100% secure payment methods. They might choose any patient, fund the treatment, and receive frequent updates and feedback until the patient is fully recovered.

Conclusion

Healthiness and access to adequate medical services are two significant indicators of excellent quality of life. Medical service improvement is hampered by a lack of medical personnel, as well as demographic and geographic issues. Telemedicine can be used to address the ageing society's increased demand for remote medical care and treatment. The World Health Organization (WHO) defines telemedicine as a type of medicine in which distance is a significant issue in the delivery of medical services. System development expenses, system deployment, digital alphabetization, digital adoption of technology, and accuracy are all major obstacles to telemedicine utilisation.

The fundamental foundation for a telemedicine service is information and communication technologies. System integration necessitates the hiring of experts who can respond to user needs and construct the necessary system. Acceptance of technology by users is critical to reaping the benefits of telemedicine. In order to avoid diagnostic errors, it is necessary to review the generated results. Telemedicine has a number of advantages. Various telemedicine solutions are used to reduce costs, promote preventative medicine, medical education, healthcare equity, and service diversity.

Telemedicine, according to studies, lowers the cost of therapy by eliminating the need for a hospital visit. In terms of cost, telemedicine benefits not only patients, but also medical institutions. Furthermore, telemedicine makes health monitoring easier and hence encourages preventative care. Telemedicine allows for the transfer and exchange of knowledge and experience. As a result, medical staff and services are improved, and the community can benefit from fair access to medical care. Finally, a wide range of medical services are seen, and technological advancements allow for further services to be provided. Many governments have recognised telemedicine as a critical instrument for

providing decent and improved medical services to all people. As a result, it is mentioned in various countries' national healthcare strategies. All relevant parties must be involved and reach agreements in order to attain the same operating standards. Telemedicine is made up of a number of systems that are linked by data formats and protocols that are widely accepted. It will take a long time to get all medical institutes to follow these formats, as some of them have their own. Standard protocols must also be followed. As a result, telemedicine entails not only constructing a new system, but also adapting existing systems. Apart from technological issues, a number of other factors must be considered, including economic and societal ones. Legal and ethical difficulties arise as a result of inaccurate diagnosis and personal data leaking. To use telemedicine successfully, proper preparation and operating procedures are essential.

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