

Digital Health

Healthcare for Everyone via Telehealth Designing a Community Hub and Spoke Telemedicine Service

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Introduction

Healthcare Services delivery over the internet represents a technological medical revolution of the current era. A significant part of Healthcare Services delivery over the internet is via several models of Telehealth which is proving of immense value.

Now, we ask, “How” not “if” practising Telehealth based care helps!



The efficacy of the Telemedicine based healthcare delivery mode is proven now. The current data support the use of Telehealth for maintaining the quality of healthcare, engaging patients, and keeping the health administration cost-effective. According to Forbes, the compound annual growth rate of 18.4% in 2020 for the Telemedicine industry is the tell-tale of its successful adoption within the care delivery system.

Various elements of Telehealth have been contributing to healthcare delivery in North America, such as Tele-OPD, Tele-monitoring, Online Medical Education, and Mobile Telehealth. The Tele-outpatient consultations ranged from 42-46% market share in 2019.

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Tele-consultations permit adequate virtual examination of patients in rural and sub-urban areas providing quicker access to treatment with a cost advantage. Scaled up smartphone technology and increasing internet bandwidth are now helping to refine Specialist Telemedicine fields such as Remote Mother & Child Clinics, Tele-dermatology, and Telecardiology facilities along with a growing range of Hub and Spoke Telemedicine in Specialist fields.



The evolving face of Telemedicine based clinical services is influencing several sectors, such as:

- Overall Improvement in Healthcare Outcomes as demonstrated in several studies comparing groups of patients
- Medical Education getting facilitated with less effort
- Professional gratification and economic sustainability getting upscaled

Telemedicine is regarded as a “healthcare delivery system involving the use of one or several forms of Telecommunication to connect a Healthcare provider (the doctor, therapist or nurse) with the care recipient

(the patient).”

Currently, live online video is used in 75-80% of Telemedicine consultations globally. Telemedicine technology is evolving fast and has lately emerged in various service designs such as:

- Store-and-forward Telemedicine
- Real-time interactive Telemedicine
- Remote Tele-monitoring



Advantages of deploying Telemedicine Services for Rural Areas

- Quicker and Wider Access to the Care Provider
- Improved Coordination between Groups of Care Providers such as Doctors, Nurses, Physiotherapists, and more
- Earlier Diagnosis helping the Treatment Outcome
- Healthcare Expenditure requirements decreasing



Quicker and Wider Access to the Care Provider

To provide safe level of healthcare, the recommended minimum Physician Density is one Doctor for 1000 people as recommended by World Health Organization (WHO). The table below shows the top ten in the world:

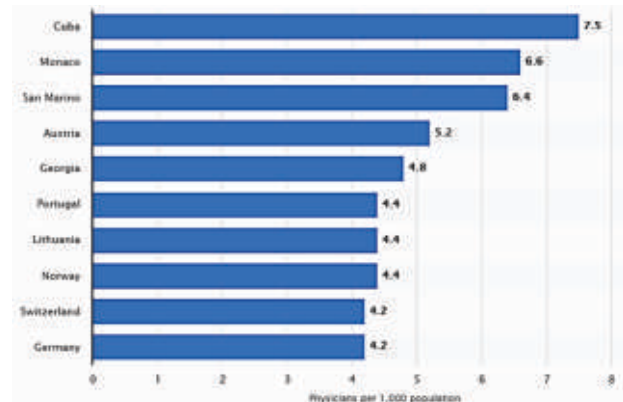


Table ref: www.Statista.com

Comparing Pakistan healthcare to the Western countries where healthcare is well-developed, the difference is vast:

- Pakistan – 0.975 doctors for 1000 patients (as of 2015)
- UK – 2.811 doctors for 1000 patients

In Pakistan, one good use of Telemedicine-based services is to connect rural area Basic Health Units to District Hospitals, thus equalizing the physician density and, mainly, make a Specialist available in a remote location, preventing inconvenience to the patient.

Cost Effectiveness of Healthcare Services

Patients are served with proven advantages such as:

- Fewer trips to the Hospitals to get a specialist advice
- Timesaving
- A lesser social burden since taking a relative to accompany to a specialist visit could cause loss of daily wages of the relative or friend.

According to a study conducted by Red Quill Consulting Inc., in the US, the average cost of a virtual visit is \$45, while attending a clinic can cost as much as \$176 per visit.



Upscaled Healthcare Outcome

The Outcome of outpatient healthcare services delivered via Telemedicine has seen to be matching that of in-person visits with the several advantages available to the patients, such as:

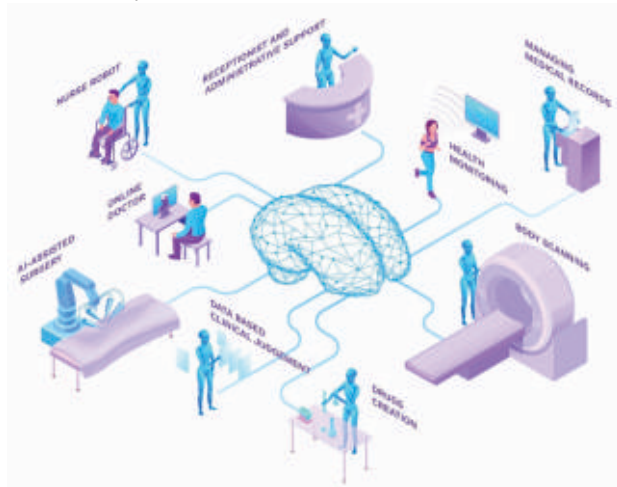
- Medical advice available, as and when needed
- Addressing Medical issues without waiting for days
- Earlier disease review leading to quicker Diagnosis helps timely deployment of management
- Tele-monitoring of hospital discharges facilitates early re-admission if needed

Telehealth Service model solving several issues of healthcare delivery

- **Low-cost Specialist Intervention:** Specialists

and Patients meeting virtually for affordable Online Medical Consultations help the low-income band people to get quality treatment.

- **Geographical Barrier removed:** Increasing number of smartphones and rising awareness is bridging the physical distance between doctor and patient via Telemedicine apps.
- **Access to quality medical care:** Patients are less vulnerable to fall prey to illegal practitioners or medical quacks as for primary care. For the same or less fee, now patients can access a qualified medical practitioner through a Telemedicine facility.



Elements of the Service Model

- **Telemedicine Spoke:** A suitably qualified nurse, a paramedic, or a Telemedicine technician, equipped with a webcam laptop on standard internet, suitably skilled to use a Telemedicine Software, would be capable of facilitating medical teleconsultations. Such facility can be a Pharmacy, a Path-lab outlet, or a dedicated Telemedicine Spoke.
- **Healthcare Service Provider:** A primary health-care advice provider (GP or Family Physician) equipped with an internet-connected laptop & webcam offering Teleconsultation over suitable Clinical Telemedicine software he/she is familiar with.
- **Appointments:** Patients either visit the Telemedicine Spoke or use the Telemedicine App to connect to the Doctor. Local marketing efforts would be required to sensitize the community of such facility.
- **Electronic Medical Records Management:** Available paper documents such as lab reports, previous hospital notes, and prescriptions along with films of X-rays, printed ECGs, and similar can be uploaded via the simplified Telemedicine plugin at the Telemedicine Spoke facility. Patients

using Telemedicine Apps can use the Smartphone or Web camera to do so.

- **Prescription Management:** The prescription will be printable at the Telemedicine Spoke with the dispensing facility at suitable venues. Another option can be an on-screen displayed prescription with Doctor's PMC number for regulatory reasons shown at the local pharmacy for buying prescribed medications.
- **Follow-up Care:** The Telemedicine Software should allow provisions while the local Telemedicine Coordinator can also set this up.
- **Requesting new investigations:** Telemedicine Software provides a suitable plugin to send direct requests to the Path-labs to save time and improve service delivery.
- **Payment for Teleconsultation:** Payment in cash at Telemedicine Spoke is preferred which removes the service charge (usually between 2-4% of the fee). Patients who connect from home can use a Credit Card which, if not available, can use a mobile Telecom service's facility for remote payment widely available in Pakistan, e.g., Jazz Cash, Easy Paisa, and others.



Telehealth Project Management Team

Teamwork is essential to use Telemedicine as a conduit between rural and urban areas, which engages several people in various roles such as:

- **Telemedicine Software Management Team – Team Leader and Managers**
 - Software Technology design support Hub and Spoke model
 - Technology maintenance with data security
 - Setting up Online Training portals for Staff
- **Project Management & Coordination Team –**

Director and Managers

- Analysing the requirements at the Telemedicine Spoke
- Researching the facilities available to doctors for providing service
- Setting up Doctor's duty roster
- Setting up Telemedicine Coordinators duty roster
- Switch and adjust from the backup pool for absentees
- Ensuring the Troubleshooting mechanism is up and running
- Ensuring the Equipment & Internet provision to all the points of care involved
- **Professional Human Resource for Teleconsultation Process**
 - Telemedicine Hub Staff such as Healthcare Providers, both Family Physicians, and Specialists in various fields
 - Telemedicine Spoke Staff such as suitably trained Telemedicine Coordinators to receive the patient and facilitate Tele-consultations
- **The Account Management and Financial Audit Team**
 - An accountant to manage financial transactions and business aspects of the project
 - To project Profit-Loss balance sheet and a financial forecast
 - Management of expenditure datasheets
- **The Project Marketing Team**
 - A digital marketer to strategize and implement a nationwide campaign for raising awareness about the service
 - Ability to setup local roadshows and branding of the service
- **The Project Correspondence Secretary**
 - To manage written and verbal communication
 - Setting up and mediation of the meetings relevant to the project



Project Leadership Roles

Technical Project Director – Role specification

- Selection of a suitable Clinical Telemedicine Software
- Effective deployment of the Software and Hardware connecting Hub and Spoke
- Telemedicine Software Training, setup via online portals with live demonstration
- Building up capacity by training selected doctors as Master Trainers
- Informational and Motivational webinars and digital TV shows for doctors and patients
- Periodic evaluation of the project and it's evolving needs such as adding new features or making new devices compatible over passage of time

Clinical Project Director – Clinical Services

- To strategize a Clinical Adoption methodology for converting an in-person practice to virtual care delivery model
- Ensuring Clinical Compliance through setting up protocols for governance
- Identifying the Key Performance Indicators for the Health Service Providers and Telemedicine Coordinators (usually non-medical staff)
- To identify and provide solutions for the issues in the domain of clinical governance and patient safety
- Setting up support teams to minimize the effort of the Healthcare providers such as triage personnel, internet, and software tech troubleshooters etc

Coordination Managers for Hub and Spoke Telemedicine Project

- Selection of the suitable medical professional in terms of experience and motivation level
- Managing incoming CVs and Phone calls from the applicants
- Matching the experience with the required level of service needed in the region
- Credentialing the qualifications and medical registration
- Shortlisting and coordinating for Online Video Interviews
- Online Video Interviewing for a structured objective and overall subjective assessment
- Management of the Contractual Agreements for the doctors
- Coordinating the Online Training schedules for

selected doctors

- Readiness as the “First Call Point” regarding the Telemedicine Software and Hardware queries for the doctors

Coordination Manager for Telemedicine Coordinators

- Researching and locating a suitable service outlet as a Telemedicine Spoke, e.g.: a pharmacy
- Researching and locating suitable Staff at the Telemedicine Spoke
 - Suitable professionals: a nurse or paramedic, or trained health technician
 - Suitable personnel as a Service Manager for managing appointments/records
- Organizing online training schedule for the Telemedicine Spoke Staff
- To be the “First Call Point” for the Telemedicine Software and Hardware queries for the Telemedicine Coordinators

Online Tele-clinics Schedule Managers

- Coordination for Online Clinic Schedule
- Coordination to provide medical cover to the online clinics
- Managing a backup medical cover
- Keeping the Tech Support up and running 24/7
- Need assessment of the local area based on the flow of appointments and workload

Potential Project Enablers

Various types of organizations can contribute and assist with the logistical, financial, or clinical support to the project through their well-known expertise and established position such as:

- Chain of Pathology Labs
- A network of Pharmacies
- Multi-specialty Private Hospitals
- Medical Organizations with nationwide chapters
- Private or Government sector Medical Schools

The intended Outcome

Sections of the population getting only fringe benefits of the medical service provided by the government will be included in the healthcare delivery infrastructure. The standards and outcome of healthcare would be improving as the timely access to qualified help will bridge the gaps of service for the people living in rural and sub-urban areas. In-time medical support shall help to minimize the disease complications, thus further lowering the disease burden.

Details of the above introduced “Community Hub and Spoke Telemedicine service” with a review on its cost-effectiveness is available with the author, based on the ongoing case study in the public-private partnership service structure to exemplify deployment and performance.

