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RESEARCH ARTICLE

TELEMEDICINE - A CRITICAL ANALYSIS OF ITS FUTURE IN INDIA

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Abstract

Background: There are enough statistics on the internet for current & future telemedicine usage pattern across geographies in terms of market size, consult volume, mobile penetration, enhanced network bandwidth, advancement in biomedical devices etc. On the other hand, there are enough differences of opinion because of challenges like patient experience, doctor adoption, accessibility, lack of centres, quality of connectivity, setup cost etc. Despite all the concerns pertaining to technology, experience, compliance and effectiveness, during the covid-19 pandemic, patients and caregivers, across countries, relied heavily on the platform to provide essential health care services to patients. During the Covid-19, telemedicine usage was an accessible and cost-effective approach to deliver high-quality care.

Objective: To get an overview of the state of affairs for telemedicine in India and its future outlook, i.e., to understand if the usage of the telemedicine platform was a temporary phenomenon during covid-19 only or continue to stay. Further, associated queries were – Is it only for some specific specialties or is it going to be limited to some geo-regions or is it restricted to patients in a particular age group or is it a function the nature of visit (first or follow up).Apart from analysing above considerations, the paper also highlighted important features of a telemedicine platform. Finally, the paper also studied the role of government as a regulatory body as well as an enabler of telemedicine platform in India.

Methodology:More than 1 year of telemedicine data for a JCI-accredited tertiary care hospital in India was studied. Additionally, physicians and patient perspective on experience and impact across multiple specialties, age group, gender and regions of the patient was further analysed. Tele-consultation trends were further compared during wave 1 and wave 2 of the covid-19. Doctor and patient experience on the usage of telemedicine were objectively assessed with questionnaires.

Introduction:-

The concept of telemedicine, or "medicine at a distance," is a part of a broader concept called "health telematics" that comprises all health-related activities undertaken over a distance using information exchange through technology. Then came COVID-19 when choices were limited and difficult, impacting care to non-covid19 patients.

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Telemedicine was a natural choice, but the adoption of telemedicine practice was poor in India due to the lack of well-defined regulations, protocols and medico-legal aspects.

In March 2020, the Medical Council of India (MCI), in close conjunction with the NITI (National Institution for Transforming India) Aayog, the country's top planning organization, issued the Telemedicine Practice Guidelines with the sole objective of enabling the registered medical practitioners to provide healthcare using a telemedicine platform. The guidelines define the scope of the work including inclusion and exclusion, roles and responsibilities of various stakeholders, tariffs and suggested technology framework for the platform. Besides this, most importantly, the guideline addresses medical ethics, data privacy and confidentiality, which were the major concerns of practitioners for the adoption of the platform because of its relative novelty, it is significant to understand the usability and experience of caregivers and patients with the telemedicine platform.

A quick background on the platform

The telemedicine solution at the JCI-accredited hospital was studied in detail to understand its features, how it is used in hospitals and how it helps patients and doctors. The solution is available on multiple platforms including iOS, Android, desktops, tablets and mobile. The patient can use this solution for booking an appointment with any doctor in 4 possible modes: video, in-person, telephony or e-mail-based chat. After selecting the doctor and the preferred slot, the patient receives a link which will take him to the session for the consult. Using the same link, the patient has an option to pay the fees of the consultation. Post the consult session, the patient receives the prescription via the link and simultaneously the resultant records are automatically saved in the Electronic Health Record (EHR) system. It is a comprehensive telemedicine platform which in turn is tightly integrated with the following systems.

1. Doctors Listing
2. Diseases, Procedures, Specialities
3. Appointment
4. Tariff
5. Medical records
6. Payment gateways with multiple options like net banking, debit /credit cards, digital wallets etc.

It is beyond a typical video conferencing platform where a doctor and patient are just a click away from each other. With the option to upload all types of files, patients can share their relevant reports, prescriptions and health records before the doctor consult. The patient can also access their previous reports, prescriptions and discharge summaries from the comfort of their home. For better patient experience, the same link can be leveraged for all milestones of the patient journey from payment, upload reports, virtual consult or download prescription.

High level typical features of the platform are:

1. Digital prescriptions
2. Planned diagnosis and treatment via text chat, audio call or video calls.
3. Practice management for physicians
4. Financial management through coding or billing
5. E-learning or continuing medical education (CME).
6. Guides to medication
7. Health calculators
8. Clinical guidelines
9. Keeping and maintaining patient records
10. Patient education and consultation

Figure 1:- A high-level context diagram of the telemedicine platform used at the hospital.

The doctors using the platform can view their appointments for the day, check the previous records of the patients and fill in recommendations online. Technology like speech-to-text conversion helps in completing the recommendation faster. In order to ensure continuity of care, consultation records are stored in EHR too. For doctors working in teams, case assignment to a team member for assessment is available before one releases the recommendation.

Few high-level advantages of the platform:

1. Real-time health - aid for patients in need of support services and direction during emergencies like COVID'19
2. Triaging - selecting the appropriate course of action
3. Virtual post-treatment assessment
4. Efficient and fair use of healthcare personnel and resources
5. Offering doctors virtual observership

Observations:-

Observations about the whole study were broadly across the following 3 areas.

Trends of the telemedicine consults with covid-19 pattern in India.

The retrospective analysis of all telemedicine consultations at the hospital for the period January 2020 to June 2021 was reviewed across all the specialties.

There were two visible peaks (in September 2020 and May 2021) seen in the number of telemedicine consultations. These two peaks coincided with the peaks of COVID-19 Wave 1 and 2 in India (Figure 2 and Figure 3 below).

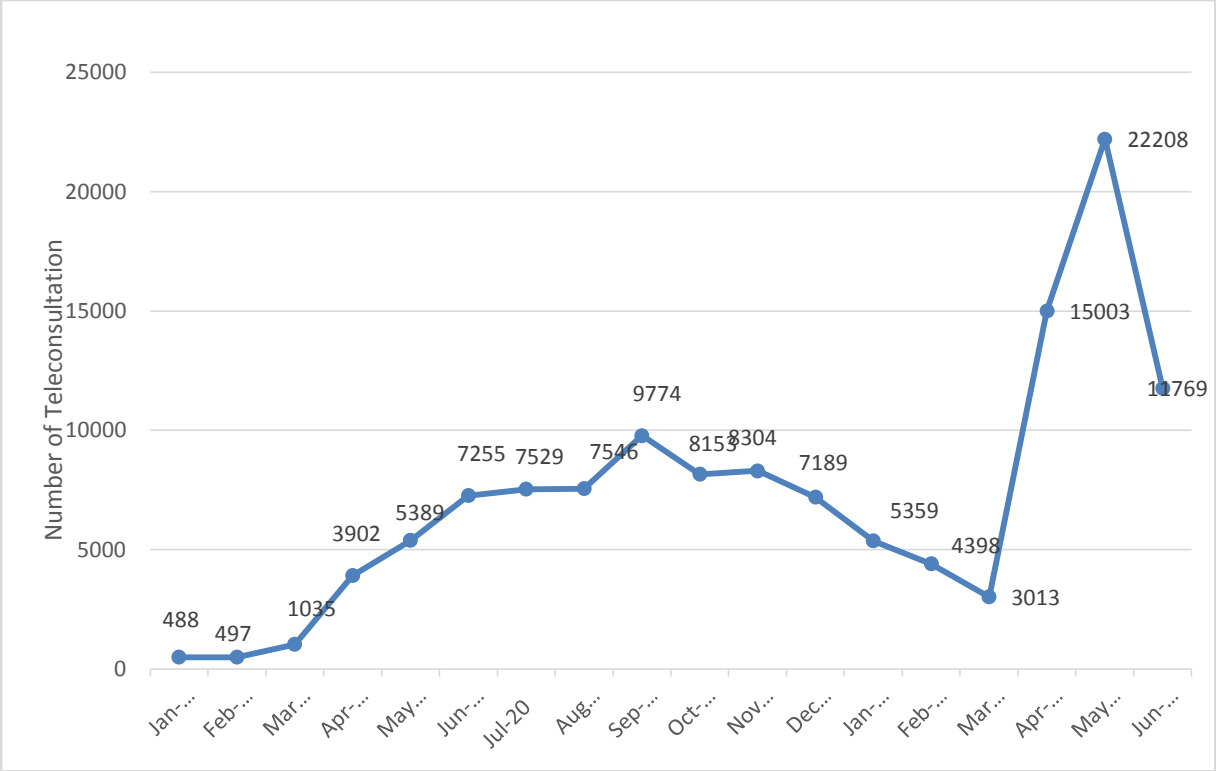

Figure 2:- Monthly Telemedicine Consultations.

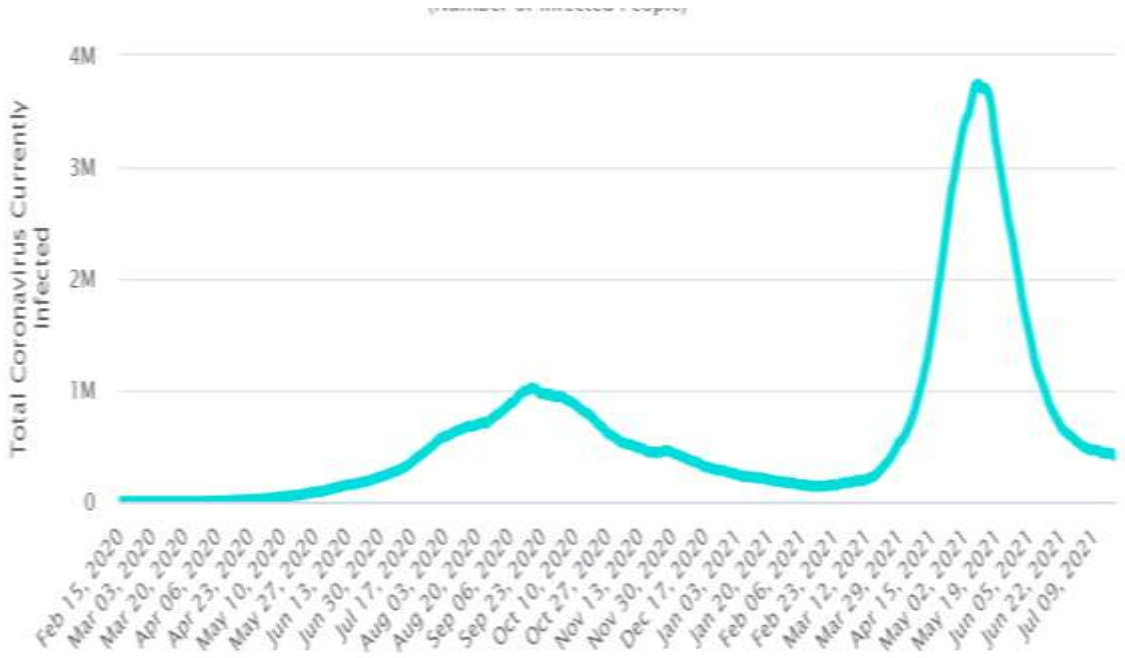

Figure 3:- Trend of new COVID 19 cases in India from Feb 2020 to Jul 2021.

At the hospital, a total of 126791 telemedicine consultations were carried out for the mentioned period which were approximately 12% of the total OPD consultations of the same period while at the peak of covid-19, telemedicine consultations were approximately 27% of the total OPD consultations. So, there is a direct correlation between telemedicine consults and the intensity of covid-19 impact in the country. Prior to the pandemic, the proportion of

telemedicine consultations in the preceding years was 0.005%, a clear indicator that covid-19 has induced an era of a tech-enabledonline patient journey starting from appointments to payments to consultations to prescriptions.

Telemedicine consultation doctors and patients' satisfaction experience:
Additionally, doctors' and patient perspective on experience and impact across multiple specialties, age group, gender and regions of the patient was further analyzed. Tele-consultation trends were further compared during wave 1 and wave 2 of the covid-19. Doctor and patient experience on usage of telemedicine was objectively assessed with two separate questionnaires on 5-point Likert's scale. A Likert scale is a psychometric scale commonly involved in research that employs questionnaires. It is a widely used approach to scaling responses in survey research. For example, a horizontal line, on which the subject indicates a response by circling or checking tick-marks.

Response to each question in the questionnaire for doctors was provided as 5 close-ended options for respondents (1= not satisfied; 2= slightly satisfied; 3= moderately satisfied; 4= very satisfied; 5= completely satisfied). Similarly, for patients, the response to each question was on 5 close-ended options (1 = Very poor, 2 = poor, 3 fair, 4 – good, 5 = excellent). Doctors across all surgical and medical specialties of the hospital participated, and their responses were included.

A sample of 30 doctors who are among the top 50 doctors using the telemedicine platform for the last 6 months were included. Survey for doctors contained 4 questions on overall experience in usage of the platform and around punctuality of the patient for the virtual consult. All these doctors were interviewed on the phone. Approximately, 53% of the doctors were very satisfied with the overall experience and the percentage of non-satisfied doctors was negligible.

Patients across age group, gender, location and specialties (in which they consulted a doctor) were interviewed over the telephone. Their percentage was broadly in line with overall telemedicine patients and a prior consent was taken from each patient before conducting the survey. The questionnaire contained 7 questions and was around overall experience in audio-video quality, doctor punctuality, clarity of prescription and explanation of the treatment plan. Out of 230 patients surveyed, approximately 57% of the patient responded on all the parameters of overall experience, clarity of prescription & explanation of treatment plan and doctor punctuality as either good or excellent.

Telemedicine future outlook:
A deeper analysis of the telemedicine data shows a contrast to typical beliefs in the usage of telemedicine. Here is a review of some misconceptions:

Misconception 1: Elders are not conversant with digital platforms.
Our observation: ~50% of the patients are 50 years or older.

Misconception 2: Patients with serious and chronic diseases have to visit hospitals.
Our observation: Neuroscience and oncology are among the top four specialities covering more than 42% of telemedicine patients.

Misconception 3: Telemedicine is a metro or a big city behaviour.
Our observation: Approximately 40% of the telemedicine patients are coming from two states which are not generally perceived in the adoption of technology.

Misconception 4: Only existing patients will use the telemedicine platform to reach out to their treating doctors as they are captives.

Our observation: Over 45% of patients are newly registered, which means during COVID-19, more and more patients have trusted super specialities hospitals having telemedicine platform offerings.

Challenges of telemedicine
For doctors and patients where satisfaction level was not good, the study also found barriers related to users, technology and infrastructure. These barriers include the lack of proper or poor internet access, health worker resistance, shortcomings in their knowledge of technology, heavy workloads, or insufficient training. A few doctors

were also of the opinion that the whole experience could lead to misdiagnosis because of insufficient examination. Both patients and doctors have concerns about the likelihood of patient privacy and confidentiality being violated because of the remote platform.

Other usages of telemedicine platform

Another usage of the telemedicine platform would be in the screening, diagnosis, management, treatment and long-term follow-up of a series of chronic diseases. The increased acceptance will also allow the growth of other fields like Tele-ICU, Tele-Ophthalmology, Tele-Dermatology and Tele-radiology etc. Not far-stretched, another logical extension of the platform would be to provide access to emergency healthcare services and reduce the huge amount of money lost in unnecessary patient transports and emergency department visits. When done the right way, telemedicine would be the golden thread uniting patients and providers and catering to the needs of patients even from the comfort of their homes.

Yet the potential for telemedicine to enhance medical care in rural India is enormous but otherwise, in a country like India where accessibility to a doctor is still a distant reality, telemedicine is the right platformto deliver remote care in a safe and efficacious manner.

Government of India'sRole in Promoting Telemedicine

The Government of India through multiple departments like the Ministry of Health and Family Welfare, Ministry of Electronic & Information Technology, National Digital Health Mission and NITI Aayog has been supporting the adoption of telemedicine by publishing the telemedicine guidelines, developing foundational digital healthcare building blocks and most importantly the launch of e-SanjeeviniOPD (https://esanjeevaniopd.in/) which provides free care from public doctors from many participating states.

Objectives of telemedicine as Perceived by Government of India

NDHM aims to ensure the following for any telemedicine consultation in India.

1. Ensure every doctor who wishes to provide telemedicine consultation has an opportunity to participate and be discovered by patients seeking care
2. Enable interoperability. Patients and doctors can use software of their choice to seek or provide care.
3. Doctors will be able to see patients medical history, and access diagnostic reports of tests they recommended with patient consent. Doctors will be able to issue digitally signed e-prescriptions to patients which will become part of their personal health records. The federated health record framework of NDHM will be used to enable this capability
4. Work towards the adoption of digital health standards for the exchange of health information among participants.
5. Administer a set of financial flows that enable payments from patient to doctor and any intermediary player/system on completion of a care transaction.
6. Enable innovation - ensure an open API ecosystem where any player can participate to create innovative new solutions for patients or doctors.
7. Monitor Quality -- develop metrics that enable monitoring of the quality of care across telemedicine consultations and ensure patients can find the right quality of care
8. Ensure verified doctors -- Patients must be assured that they are dealing with genuine well-trained caregivers on a remote consultation
9. Enable grievance redressal for doctors, patients or care intermediaries in the ecosystem

Quality of care for telemedicine cases

NDHM would like to ensure that all telemedicine consultations are of high quality in the ecosystem. Every telemedicine consultation will be rated by both the end user and the doctor.

Apart from the rating system, specific grievances can be raised related to end-user app providers, Health Care Provider platforms (HSPs) or doctors.

NDHM will evolve a consultative process that will ensure very poorly rated users/doctors or those with high grievance rates are not participating in the ecosystem.

Grievance redressal in telemedicine cases
NDHM has set up a helpline for users of the NDHM ecosystem including doctors, healthcare providers and users. This helpline will also support grievances related to the telemedicine service. NDHM will only handle grievances related to telemedicine technology or financial transactions thru this system. Other grievances will follow the approaches available for physical consultations.

Each end user application and HSP that registers with the telemedicine gateway is expected to appoint a nodal officer who will resolve grievances within the stipulated SLA. NDHM will have a grievance team that will oversee the process to ensure that EUA or HSP is resolving grievances as expected.

Implementation Approach for mass rollout of telemedicine rollout
I am of the view that NDHM should work closely with existing practitioners and industry bodies to ensure that the objectives align with their needs. As part of this initiative, a strong engagement and feedback mechanism from various stakeholders in the telemedicine ecosystem should be established for the positive growth of telemedicine consultations in the country.

NDHM should review and explore open-source technologies in the telemedicine area for better cost management and also for effective community-based software development.

All digital public goods that are part of NDHM will be implemented only in secure cloud infrastructure. All components and Open APIs should meet the security and privacy requirements.

The NDHM should retain strategic control of the overall ecosystem and set policies related to on-board HSPs and end user applications. Every software should integrate with the NDHM Telemedicine Gateway and other components should be first validated for compliance via the NDHM process.

The way forward
To keep the nation healthy, it is important that the healthcare you receive should not depend on the place you live. So, the aim is to ensure that the platform reaches the remotest corner of the country. The Following three actions clearly stand out:

Firstly, effective aggregators and partnerships, including public-private partnerships, will be essential to ensure that telemedicine is adopted at scale. Although these partnerships may require complex arrangements, the solutions need to be simple and take the real needs and local contexts into account to ensure that telemedicine services are tailored to diverse patient groups.

Secondly, communicating the value of telemedicine for both physicians and patients is key for scaling uptake. It may be logical to use telemedicine, but long-standing opinions and attitudes of people may stand in the way. The rise of telemedicine will be invigorated by increased knowledge and subsequently willingness tothe uptake of telemedicine. Important barriers to development need to be tackled.

Thirdly, the regulatory environment needs to become conducive to supporting innovative health technology models. This includes the protection of data rights, patients' and clients' rights, risk-based regulation for telemedicine, and the promotion of responsible innovation.

Conclusion:-

It is unwise to discuss the platform's future without mentioning COVID-19. During the pandemic, known gaps in healthcare delivery widened further. These gaps and deficiencies were in the context of infrastructure, skills, cost and technology in countries rich and poor, large and small. If addressed conventionally, these gaps in healthcare delivery will widen further. Primed by gaps in demand and supply even in pre-pandemic times, healthcare was transitioning towards technology adoption, but COVID-19 simply amplified this transition. It is a platform which can be leveraged to achieve the United Nation's Sustainable Development Goal to achieve Universal Health Coverage by 2030.

Now with the changed behaviour of patients and clinicians, telemedicine will emerge as the new norm in healthcare delivery. The technological advancement will further enhance the adoption and will certainly lay the foundation of **healthcare for the masses.**

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Primary Research

1. Doctors were provided 5 close-ended options for respondents (1= not satisfied; 2= slightly satisfied; 3= moderately satisfied; 4= very satisfied; 5= completely satisfied). A sample of 30 doctors who are among the top 50 doctors using the telemedicine platform for the last 6 months was included.
2. For patients, the response to each question was on 5 close-ended options (1 = Very poor, 2 = poor, 3 fair, 4 – good, 5 = excellent). Patients across age group, gender, location and specialties (in which they consulted a doctor) were interviewed over the telephone. Their percentage was broadly in line with overall telemedicine patients. Prior consent was taken from each patient before conducting the survey.