How Telemedicine is Changing Future of Indian Healthcare.

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Abstract:

Telemedicine, also known as telehealth is transpiring itself in the Indian healthcare sector in today's world. Telehealth comprises of using telecommunications and electronic media to broadcast therapeutic, preventive and pharmaceutical data over communication channels. In traditional healthcare setup, people can face challenges suchlike hindrance in availing medical services, overcrowded hospitals and delay in service. This paper puts light on the impact of telemedicine on rural regions which constitutes about 66.46% of Indian population back in 2017, disparity in the number of patients to the doctors and why telemedicine is the need of the hour for Indian healthcare. It also puts forth the idea of using sensors and mobile based applications for monitoring patient's current health position remotely.

Keywords: Telecommunications, communication channels, healthcare setup, sensors, mobile based applications.

1. Introduction:

The ever-growing need of healthcare in India can be satisfied with the help of telemedicine and traditional healthcare hand in hand. India is now currently in need to adopt technology driven healthcare due to large demand of health services and scarce availability of the same.620 million population is lacking in availability of health services. Only 0.9% of Indian economy is constitutes the expenditure on Healthcare. Due to lack of infrastructure facilities doctors are not willing to stay in the rural India. 89% of rural people have to travel long distances for availing better medical facilities [5]. Thus telemedicine can help in overcoming this distance barrier. Secondly, the doctor patient ratio in India is one government doctor available to10,189 people that implies deficiency of 600,000 doctors. This issue can be resolved through video conferencing, tele presence, tele consultation. 99% of diseases can be treated without operation at remote place with help of telemedicine. Telemedicine has proved to be gainful in terms of money-saving,

time saving and robust. Tele-diagnosis is an efficient way that can help doctors to examine patients from remote locations[9]. With the help of mobile based application, by merely uploading prescriptions, patient can find cure for their illness. Indian Space Research Organisation (ISRO) & The Ministry of Information Technology's National Informatics Centre together accelerates the delivery of telemedicine to the end-user, which motivates more practical deployment of telemedicine [2].

2. Literature Review

[1] Emerging Trends of Telemedicine in India: The main aim of this paper is to put light upon Telemedicine, it's needs in the current world, its importance, challenges faced & most importantly benefits of telemedicine. Telemedicine is having influence on the healthcare industry which leads to technological advancements and also effect of price / cost on different medical treatments. The ever-growing technology has been proved as a boon to this industry. This paper provides the practical implementation of Telemedicine mostly in the rural parts of India, and the use of technology to deliver healthcare beyond distance barriers. It also gives us an insight to the practical challenges faced in telemedicine. This paper gives proper idea of Telemedicine and its different aspect on the Indian Healthcare market.

[2] India: Telemedicine's Great New Frontier: The paper states that how India is now currently in need to adopt technology driven healthcare. It also gives practical examples that has been implemented in different areas of rural India, and how beneficial it has been proved. Technical ministries take the major role in motivating telemedicine, successes on a large scale due to efforts taken by Online Telemedicine Research Institute, Indian Space Research Organisation (ISRO) & The Ministry of Information Technology's National Informatics Centre together accelerates the delivery of telemedicine to the end-user, which motivates more practical deployment of telemedicine. This research provides statistics of current ratio of hospitals, doctors, & patients in India. It proves how well telemedicine has helped people in times of crisis.

[3] The Competitive Business Impact of Using Telemedicine for the Treatment of Patients with Chronic Conditions: The aim of the paper is to prove the impact of telemedicine on competitive business, in the field of treatment of patients with chronic diseases. It suggests cost effectiveness of telemedicine's, and how it overcomes distance barriers, it states 3 major things:

1.   That telemedicine would not replace doctors on place, despite being convenient.

2.   Competitors will coexist without offering telemedicine services too.

3.   Establishing relationship between hospitals and LCH's.

The paper proves that unlike other technology driven websites it will not cause losses to other competitors maintaining competitive equilibrium.

[4] Telemedicine in India: The Apollo Story: Issues and Challenges in Implementing Telemedicine, Clinical Telemedicine, Information and Communication Technology Scenario in India, Apollo's Health Super Highway, Forage into M-Health are the main points covered under the paper. Its states that it was

difficult for Apollo to change the mindset of the people about telemedicine and its usage. It also states that with ICT, it revolutionizes telemedicine in India.

[5] Telemedicine in Rural India: Purpose of the paper is to put light on telemedicine's impact, and its necessity in Rural India. ISRO's contribution to telemedicine, Growth results of telemedicine in India, Challenges and controversies, it's impact. It states that 99% of diseases can be treated without operation at remote place with help of telemedicine.

[6] Can telemedicine change the future of healthcare delivery: The paper states that telemedicine is changing the future of healthcare delivery. It gives information about Market of telemedicine, factors driving adoption, how to remove barriers between the patients and doctors. It provides the challenges of telemedicine, bridges between the digital divide and consumer belief.

[7] Health care Headache: It explains about practice of technology, the statutory and regulatory requirements, best practices and evolving trends, legal legacy for telemedicine, and board of licensing medicine and pharmacy.

[8] Anatomy of Successful Business Models for Complex Services: Insights from the Telemedicine Field: Classification of business models. Identification white spot of future business opportunities in telemedicine. Identification of pattern success business models. Complex service business model frame allows one to survey, explain, and categorize the actual workings of models for telemedicine facilities and thus includes handout to the sector of telehealth, while it expands frontier of service science by displaying how particular service science ethics can be integrated into business model innovation. How the role of IT for telemedicine, teleconsultation services IT & NON-IT.

[9] Early Identification of ASD Through Telemedicine: Potential Value for Underserved Populations: Tele-diagnostic accuracy, evaluation tele-diagnostic feasibility and acceptability in a rural catchment, findings support preliminary feasibility, accuracy, and clinical utility of telemedicine-based assessment is the purpose of the paper. In this research they have sample of rural people and affect our capability to give conclusions towards the values of the telemedicine procedure. In coming times this work will be critical to verify how tele diagnosis works for a large scale, sample. Practicability and social acceptance, specific use of the telemedicine procedure within a rural health centre setting was able to provide diagnoses and access to follow up routine for number of families. Significantly, the families have involved at a smaller landscape and time hinderance when accessing traditional hospital-based ASD diagnostic centre evaluation.

[10] Telemedicine- An Innovating Healthcare System in India: The paper gives an idea of what telemedicine actually is in a simpler sense. It describes telemedicine as a way through which a doctor and patient can connect over phone or video conference . It states the use of Information Technology for the same.

3. Methodology:

The communication channels used by telemedicine include Medical Information Websites, Mobile Apps, Text Alerts and Notifications. It also suggests the use of hardware like clinical carts, laptops, tablets, digital cameras, telemedicine software, telemedicine kit's, database, cloud services and AI. Artificial Intelligence is the top trending technology in Telemedicine too. The complex AI algorithms can manipulate, process and interpret medical data in fraction of seconds unlike human brains. Deep learning can be applied for radiology related medical data; clinical data science is also an emerging field. Cloud 3D print which can replace human organs is a promising future in AI. It can guide surgeons during surgery. This paper suggests the use of patient health monitoring system using IoT. The follow up routines for the doctors can be made convenient through use of sensors, beacons, and wearable devices. The patient room will be monitored through the sensors and the beacons in his/ her room which will transmit the data onto the doctor's mobile based application, like the previous reports of the patient, medications. The wearable device on the patient's body will give his/ her current health readings, which in case fluctuating will give an emergency alert on the doctor's phone.

4. Future Scope:

The research provides useful and practical information about the implementation of telemedicine in India and how it's revolutionizing Indian healthcare sector. It can be rightfully stated that India has embark towards an era of e-doctors and medical applications. Use of telemedicine has led to more costumer involvement like people maintain and care for their health check-ups, follow ups and even concealing for mental health through mobile based applications. It has proved as a blessing for the rural population as mention earlier as they are able to easily reach out the doctors curbing distance barrier and also prevent the future risks. The cost for treatment has also been reduced as there is no need of travelling or spending money on unnecessary things. One of the most important implication of telemedicine is that it has speed up the healthcare delivery system in India. A person in case of emergence can just dial a 3-digit number can call up an ambulance over phone or within one touch on screen can book an appointment or check his/her medical reports. The study proposes a method to implement telemedicine using IoT, that can be equally beneficial for the doctor as well as patients. As mentioned earlier, as soon as the doctor enters the patient's room, he will get a report and update of the patient's health stability on his/her mobile. We can deploy beacons and sensors at the different corner of the room for this purpose. Doctor when at a distance from the patient's room can still monitor patient's health. The data will be stored on a cloud-based storage as it will constitute under big data. In the similar way, patient can use the mobile based app in case of emergency or for follow up over the internet and so forth.

5. Challenges:

The following are the limitations with regards to Telemedicine deployment in India.

1. There's hesitation in adopting Telemedicine because of the misconception that it will replace people: People fear losing their jobs and being replaced by technology.[1]

2. People think that telemedicine isn't cost-efficient and will lead to more expenditure: There's a huge misconception in the society that this advance technology will cost more and won't be cost efficient.[1]

3. Communication barrier: People can face difficulties while communicating in English.[1]

4. Legal aspect of telemedicine in India.

5. Medical data security and privacy concern: The data which has been collected for interpretation is at potential risk as internet is an open channel.

6. Untrained employees: The workers at the hospitals must be made familiar and comfortable to use through trainings and workshops.

6. Conclusion:

Telemedicine would not replace doctors on place, despite being convenient[3]. Competitors will coexist without offering telemedicine services too[3]. Technology along with healthcare proves to be an boon to Indian health sector.

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