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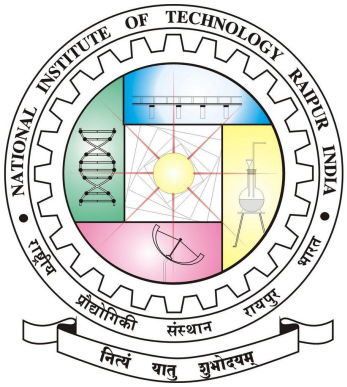

Project Report

Introduction to the practice of telemedicine and its future

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April 8, 2022

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Abstract

The present healthcare environment is favorable to big changes, including a big emphasis on telemedicine. Telemedicine has risen to the forefront of medical reality as a result of recent technical advancements and external forces.

The**Centers for Medicare Medicaid Services (CMS)**has declared that telemedicine should be used to offer treatment to patients in hospitals, clinics, nursing homes, and other locations around the country. New policies have also been created in order to improve patient care, safety, and privacy.

The ease with which this low-resource modality allows physician contact and provides a viable option for patients who are medically or socially unable to meet their doctors in person. Considering the nature of the business, however, great thought must be given to developing patient connections and comfort.

Telemedicine's significance on healthcare environments in the future cannot be emphasised, particularly in hospice and nursing home settings, where technology has the potential to increase treatment efficacy and monitoring for the elderly. Newer developments, such as the remote patient monitoring system, can serve as safety nets for clinic patients, while improved access to electronic health records (EHRs) will vastly expand treatment possibilities. The growth of telehealth, on the other hand, is dependent on community reimbursement and physicians' ability to reliably provide the same treatments that are accessible in person. Additionally, physicians and other healthcare professionals must incorporate these new technology into their areas while protecting patient security and autonomy ethically.

Keywords:

- Telemedicine
- Telehealth
- Healthcare
- Patient
- Diagnosis
- Digital

1 Introduction

Telemedicine is a fast expanding service that aims to enhance access to high-quality, efficient, and cost-effective healthcare, particularly in the midst of the present COVID-19 epidemic. Telemedicine, as defined by the **Centers for Medicare and Medicaid Services (CMS)**, is *"a service that aims to enhance a patient's health by allowing two-way, real-time interactive contact between the patient and a physician at a remote site."*
The phrases 'telehealth' and 'telemedicine,' while similar, should not be used interchangeably. Telehealth is defined as "the application of telecommunications and information technology (IT) to enable remote access to health evaluation, diagnosis, intervention, consultation, supervision, and information."
As a result, telehealth can be thought of as a broader definition of telemedicine that includes technology such as telephones, email, and remote patient monitoring (RPM) devices that are used to collect and transmit patient data for the purposes of providing health education or ancillary healthcare services.
Improvements in technology have drastically expanded the accessibility and quality of treatment accessible digitally during the last several decades. Despite this, due to strict legal requirements and an absence of adequate payment structures, telemedicine has struggled to gain widespread use. Using "live-chats" and video calling, health care practitioners may now give healthcare directly to patients in the comfort of their own homes.

Healthcare experts are experimenting with web-based telemedicine services as potential medical regime alternatives. To promote medication adherence and convenience, Bluetooth pillboxes may be purchased online. With only a few keystrokes, a patient may now access almost unlimited medical information, making it both quick and cost-effective. These medical procedures will surely stimulate worldwide medical groups to investigate the future of telemedicine and solve global health concerns that are growing.

2 Prerequisites for a Telemedicine visit

Telemedicine is a low-resource mode of treatment. To perform a telemedicine visit, a provider need a computer with microphone and camera, a smartphone, or a tablet with a secure **Health Insurance Portability and Accountability Act (HIPAA)**-compliant platform. Video conferencing software must have encryption, access restrictions, and audit logs in order to be HIPAA compliant. Encryption masks sensitive information into a manner that is unreadable without a decryption key, preventing unwanted access to protected health information (PHI). To assign activities to individual users, access controls employ unique login credentials (who are designated different levels of PHI based on their job roles). Audit logs keep track of who has access to what information and for how long, allowing inappropriate access to PHI to be identified immediately.
Basic telemedicine features are available in a variety of electronic health record (EHR) systems, including Allscripts, Cerner, and Epic. HIPAA specifies that the vendor must keep track of the data while it is being sent. Vendors should give clients with a business associate agreement (BAA) that assumes responsibility for any violations under their supervision to fulfil HIPAA guidelines. To conduct telehealth, healthcare practitioners can utilise popular video chat services such as Apple FaceTime, Facebook Messenger video chat, Google Hangouts video, Zoom, or Skype.
Health & Human Services(HHS) also advised clinicians to inform patients that these third-party software may pose a privacy risk, and that while utilising such apps, caregivers should activate all encryption and privacy options. These platforms can still be utilised in an emergency, but physicians should be aware that their usage may in the future be in violation of HIPAA rules.
When performing telemedicine visits, HIPAA Rules must be addressed in addition to the video service used, because those who can hear or view the video session may not be visible to the health care professional. As a result, it's critical for health care practitioners to ask patients if there are any other people in the room who might not be seen on camera and to get their consent for them to be in the "virtual room."

3 Patient Safety in Telemedicine

Patient safety is critical, and it must be incorporated into telemedicine standards in addition to HIPAA. Patient safety include identifying the patient, verifying a phone number in the event of a disconnect, determining the patient's physical location in the event of an emergency, and verifying emergency contact information. EHR templates may be created to urge physicians to inquire about and record this safety information. When emergency medical services are required, it is critical to have the patient's actual location (rather than their address) during the visit to give to dispatch operators. For patients who may engage in their telemedicine appointment in a parked automobile, health care professionals should keep this in mind—the make, model, licence plate number, and position of the parked car will be essential in these emergency scenarios.

4 Advantages of Telemedicine

In 2020, telemedicine's popularity skyrocketed. Slowing the spread of the coronavirus was a primary driver of the expansion at the time. This advantage isn't limited to the epidemic. Visiting a doctor's office exposes you to a variety of diseases and viruses, which might worsen your condition.

Telemedicine services can be more effective than in-person sessions when it comes to getting healthcare. Patients can save time and money by not going to the doctor's office. As a patient, you have the option of receiving medical treatment at a time that is convenient for you. You don't have to leave the comfort and safety

of your own home; this is especially beneficial for people who are disabled or old.Through remote monitoring devices and wearables, more individuals can benefit from preventive care due to easier access and lower costs.

By visiting patients remotely, healthcare practitioners, like patients, may reduce their exposure to infections and diseases.
If providers spend less time visiting patients in their offices, they may profit from decreased overhead expenditures. Doctors require less medical and administrative support employees when patient traffic is low.

Offering telemedicine services, on the other hand, can give healthcare professionals with a new income stream by allowing them to see more patients in less time. Consulting from a distance also allows for more flexible appointment schedules.

5 Limitations of Telemedicine

A physical evaluation by a doctor is frequently required to gain a complete grasp of a patient's condition. One of the most major limitations of telemedicine is the lack of physical examinations. Moreover, doctors can learn more about a patient's condition in person than they can through video or phone.

Technological platforms for successful telemedicine consultations are still evolving. As a result, deciding which product to invest in is difficult for physicians. Patient consultations might potentially be hampered by poor cellphone signals or internet access.

Telemedicine may cause a delay in treatment if you require immediate or emergency care. While doctors can deliver information through video call or text message, they are unable to provide direct care.

Another possible difficulty is the accuracy of the computerised diagnosis you obtain. Telemedicine relies on patients providing detailed descriptions of their symptoms in order to be helpful. Not everyone is capable of doing so in a way that allows professionals to make a diagnosis. Patients' diagnoses may be incomplete if they omit to mention one or more of their symptoms.

Depending on the health care facility's scheduling system, arranging telemedicine appointments might be problematic as well. Various scheduling methods are being used to build a hybrid patient-centered scheduling strategy that combines virtual care with traditional face-to-face treatment.

6 Future of Telemedicine And Technological Advancement

More over half of the world's population has a smartphone, and the market is expected to increase by 9.3% by 2020, reaching 3.5 billion users. These little pocket computers have revolutionised many aspects of our lives; from banking to ordering meals to scheduling appointments, we can now do practically anything on our smartphones. This tendency is now being used on a broad basis by telemedicine. As healthcare providers invest predominantly in mobile applications for virtual services, the future of telehealth is dependent on the expanding use of smartphones. It's comfortable and easy, and it considerably reduces the time it takes to connect with a healthcare professional when utilising such gadgets. Who knows, while telemedicine will be a completely new idea in 2020, we may all be able to see our doctors online in ten years.

Remote patient monitoring will be one of the most significant developments in telemedicine in the near future (RPM). RPM lets a patient to wear a gadget that sends information to their phone or tablet, allowing them to keep track of their health. Automatic insulin pumps, digital blood pressure cuffs, and digital heart rate monitors are just a few examples. RPM systems let patients to submit real-time physiological data to their doctors, allowing for more efficient monitoring of their health. Patient readiness to adapt to new technologies is one of the most important drivers of RPM progress
. According to a poll conducted by VivaLNK, nearly two-thirds of patients aged 40 and over would be ready to wear an RPM device if it meant fewer visits to the doctor. New RPM technologies are quickly evolving, with new monitoring capabilities being launched on a regular basis. With the developments in telemedicine, this tendency will continue.

Another advancement in telehealth is the incorporation of artificial intelligence into user health apps. App software algorithms can detect patterns in patient outcomes and advise the patient to take preventive action before symptoms appear. Bots may be built into the applications to begin collecting ailments and other information from patients when they seek an appointment, and then relay that information to the clinician prior to the encounter. The increasing incorporation of artificial intelligence into telemedicine technology could improve the applications' usability, boost access to care, and help patients stick to their treatment programmes.

Moreover,most of the telemedicine disadvantages previously mentioned have solutions and alternatives to make it simpler for patients, providers, and facilities. The future of telemedicine is ultimately dependent on the future of telemedicine funding. Providers and patients are becoming accustomed to this "new normal" of telemedicine-based health care delivery, but its long-term viability is contingent on funding.

7 Conclusion

Physicians can now care for their patients while reducing the danger of coronavirus infection thanks to telemedicine. Because of the flexibility given by telemedicine, doctors' capacities in both inpatient and outpatient settings have grown. Our healthcare staff have found that using software to communicate with patients, obtain a history, and do a short physical assessment has proven to be important tools. The use of this technology has reduced direct exposure to Person Under Investigations and, in certain instances, eliminated the necessity for some consulting doctors to enter the patient's room. Workflows for both residents and attending physicians have been adjusted to account for the lack of direct physician-to-patient interaction, and the introduction of telehealth has sparked a paradigm change.

Patients with difficulties to healthcare, such as distance (particularly in rural regions), transportation, or caretaker availability, might benefit from telemedicine. Patients with impaired immune systems no longer have to worry about contracting infectious infections. Patients who have been waiting months to see a specialist in their area can now see a selection of doctors around the country and be treated sooner. When a patient forgets about their appointment or mistakenly misses it due to one of these barriers, a physician can still deliver treatment to the patient utilising telemedicine, eliminating the need to reschedule, reducing missed opportunities and increasing clinic efficiency.

8 Acknowledgement

I am grateful to Dr. **Saurabh Gupta** sir for his proficient supervision of the Term project on *Introduction to the practice of telemedicine and its future*. I am very thankful to you sir for your guidance and support.

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Date of Submission: 06/04/2022

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