TELEMEDICINE – A STEP TO BETTER PATIENT CARE

Dr. Shweta A. Panchbudhe1, Dr. Veena Mahajan2, Dr. Pranjali Deole3,

1 Datta Meghe College of Physiotherapy, Nagpur, Email Id: shweta12panchbudhe@gmail.com
2 J.M. Patel College Bhandara, Dist. Nagpur, Email Id: mahajanveena2020@gmail.com
3 Shri. Ramdeobaba College of Engineering and Management, Nagpur, Email Id: deoleps@rknec.edu

Abstract

A Across medical specialties, telemedicine studies have proven success in reducing geographical limits, time spent, and money incurred by patients with beneficial health results. The purpose of this study is to assess the impact of telemedicine on health policies. In this paper a review of telemedicine methodologies has been presented to see its impact on the patients’ health.

Keywords: telemedicine, utility, health, ICT, Services

DOI Number: 10.48047/nq.2022.20.9.NQ4428

1 Introduction

The delivery of health-related data and information through electronic data and telecommunications technologies is known as telemedicine, also referred to as telehealth. In other words, telemedicine is the practice of providing and facilitating healthcare when participants are separated by a substantial distance through the use of electronic information and communication technologies.

The words "tele" and "mederi" are derivatives of the Latin and Greek words, respectively, for "to cure" and "distance," respectively. Telemedicine is known as "healing by wire" according to Time magazine. Telemedicine, which was once seen as "futuristic" and "experimental," is now a reality and will not go away. Numerous uses for telemedicine can be found in management, research, education, patient care, and public health. Both developed and developing countries could benefit from using information and communication technologies to address some of the issues they have with providing high-quality, inexpensive healthcare services.

Information and communication technologies (ICTs) are used in telemedicine to get beyond geographic limitations and increase access to healthcare treatments. For rural and underprivileged communities in developing nations, who have historically had limited access to healthcare, this is especially useful. Computers, the internet, and mobile phones are examples of modern information and communication technologies that are transforming how people communicate with one another, seek and exchange knowledge, and improve their lives. These technologies offer enormous potential for addressing the current issues in global health.

2 Definition And Concepts

What is telemedicine?

By extending access to care and medical information, telemedicine uses information and communication technology (ICT) to enhance patient outcomes. In its literal sense, "telemedicine," which first appeared in the 1970s, is in the interest of advancing the research, evaluation, and continuing education of healthcare professionals, all in the interest of advancing the health of individuals and the global community, all in the pursuit of improving both individual and global health.

METHODS AND MODALITIES

In order to overcome issues with video stability and bandwidth restrictions, participants in telehealth must have good internet access, typically in the form of a strong, dependable broadband connection and broadband mobile communication technology of at least the fourth generation or long term evolution standard. Telehealth has become more accessible as broadband infrastructure has grown.
METHODS OF DELIVERY

Store-and-forward telemedicine is the practice of obtaining medical data—such as biosignals, pictures, and other data—and transferring it to a physician or other medical professional for later offline review. It is not necessary for both parties to be present at the same moment. Teledermatology, radiography, and pathology are some of the most popular specialties that are well suited for asynchronous telemedicine. This transfer should contain a well-organized medical record, ideally in electronic format. The "store-and-forward" strategy compels the physician to rely on an audio/visual report and a history record rather than performing a physical examination.

Videotelephony

Videotelephony describes the technologies that let people in different places send and receive audio-video signals to talk to one another in real time. Early on in the development of the technology, picture phones—similar to slow-scan TV systems—Every few seconds, the machines would swap still images over standard POTS-style phone lines. Videotelephony with sign language and a video relay service can be used by the deaf and speech-impaired, as well as people with mobility challenges or who reside in remote locations and require telemedical or tele-educational services.

Remote monitoring

Medical personnel can remotely observe a patient utilising a range of technology gadgets thanks to remote monitoring, often known as self-monitoring or testing. Chronic conditions or particular illnesses like heart disease, diabetes, or asthma are the ones that this tactic is most frequently utilised to treat. These services may improve patient happiness, be more affordable, and produce health outcomes that are comparable to those of conventional in-person doctor visits. Better joint management and midnight home dialysis are two examples.

Real-time interactive

Electronic consultations are made possible by interactive telemedicine systems, which allow for real-time communication between patients and doctors. Videoconferencing has been utilised for a variety of clinical objectives in a variety of clinical professions and contexts, including patient care, diagnosis, counselling, and monitoring.

3 Utilities Of Telemedicine

- Easy access to off-the-beaten-path locations
- Telemedicine can considerably reduce the time and cost of patient transportation in peripheral health settings.
- Monitoring ambulatory monitoring and home care
- Enhances communication between health care providers who are separated by a great distance.
- Critical care monitoring in cases where the patient cannot be transferred.
- Clinical research and continuing medical education
- A disaster-prevention tool
- A second opinion and difficult interpretations
- Once connectivity has been established, the greatest hope for telemedicine technology is that it will be able to offer knowledge to medical procedures.
- Telemedicine-assisted surgery with hand robots
- Disease monitoring and programme evaluation
- It offers a chance for uniformity and equity in the delivery of healthcare, both inside and between nations, regions, and continents
- Telemedicine and communications are crucial tools for enhancing and delivering rehabilitation services in remote regions, according to the Centre for International Rehabilitation. Telemedicine cannot replace doctors in remote locations, especially in developing countries with limited resources and numerous public health issues. As a result, expecting this technology to be able to replace hesitant doctors at this moment is unrealistic. In most countries, however, it has the potential to considerably improve the existing health status

4 Elements Of Telemedicine

- Its goal is to give clinical support.
• Its goal is to break down geographical barriers by linking users who are not in the same physical area.
• It incorporates the use of various types of ICT.
• Its goal is to enhance health results.

5 Current Use Of Telemedicine Services

To acquire a sense of the current state of the telemedicine service supply, comprehensive polling was conducted in four of the most well-known and well-established domains of telemedicine. Respondents were asked to say whether their nation offered services in each field, and if so, at what stage of development. "Established," "Pilot," and "Informal" were the stages of development. The survey examined four fields of telemedicine:

**Teleradiology** - Digital radiological images, such as X-ray images, are transmitted between sites using ICT for interpretation and/or consultation. Teleradiology has the highest rate of established service supply out of the four areas of telemedicine that were investigated.

**Telepathology** - Using information and communication technology to transmit digital pathology results (such as microscopic images of cells) for interpretation and/or consultation.

**Teledermatology** - ICT is used to transmit medical data concerning skin conditions (such as skin tumours) for interpretation and/or consultation.

**Telepsychiatry** - Use of ICT for psychiatric evaluations and/or consultation via video and telephony.

Other fields include:

**Telenutrition** - refers to a nutritionist or dietician who offers video conferencing or telephone consultation online. Patients or clients submit vital statistics, dietary records, food photos, and other data to the TeleNutrition portal, which a nutritionist or dietician then analyses. The nutritionist or dietician may then establish goals for their patients or clients and monitor their progress through follow-up consultations.

**Telepharmacy** - is the administration of pharmaceutical care to patients through a telephone in circumstances where they would not normally have direct contact with a pharmacist. It serves as an example of the larger telemedicine phenomenon in relation to pharmacy practice. Telepharmacy: Services include formulary compliance monitoring by teleconference or videoconference, patient counselling, prior authorization and refill authorization for prescription medications, and drug therapy monitoring. The automated remote packing and labelling of medication is another description of telepharmacy. Telepharmacy services are provided by retail pharmacies as well as hospitals, nursing homes, and other medical care facilities.

**Telenursing** - the use of telecommunications and information technology to deliver nursing services when there is a significant physical distance between the patient and the nurse, or between any number of nurses. It falls under the umbrella of telehealth and connects to a number of other medical and non-medical applications, such as telemonitoring, teleconsultation, and telediagnosis, among others.

**Teledentistry** - Teledentistry, which uses information technology and telecommunications for dental care, consultation, education, and public awareness, is related to telehealth and telemedicine.

**Teleaudiology** - is the use of telehealth to deliver audiological services, which may encompass the whole range of audiological practise.

**Teleneurology** - In, it is discussed how mobile technology might be used to provide neurological care remotely, including therapy for stroke, movement disorders like Parkinson’s disease, seizure disorders (like epilepsy), etc. We have the opportunity to increase access to healthcare for billions of people worldwide, whether they live in urban centres or in remote, rural areas, by implementing teleneurology. There is proof that people with Parkinson’s disease prefer developing a close bond with a remote specialist over their local doctor. Such home care is useful, but it requires knowledge with the internet. For individuals with Parkinson’s disease, teleneurology appointments are reportedly less expensive than in-person ones because they need less time and travel.
Teleneuropsychology -- is the use of telehealth/videoconference technologies for the remote administration of neuropsychological exams. Neuropsychological tests are used to evaluate the cognitive condition of patients with known or suspected brain diseases and also produce a profile of their cognitive strengths and limitations. Numerous studies have proven that many popular neuropsychological tests can be administered remotely by videoconference and produce test results that are equivalent to those of in-person evaluations, laying the groundwork for the reliability and validity of teleneuropsychological testing.

Telerehabilitation-- is the provision of therapeutic services via telecommunications and Internet networks. Clinical evaluation (the patient’s functional abilities in his or her environment) and clinical therapy are the two most common service types. Telerehabilitation has been studied in a number of rehabilitation-related fields, including neuropsychology, speech-language pathology, audiology, occupational therapy, and physical therapy. Due to a handicap or a lack of time, telerehabilitation enables patients to receive care even if they are unable to physically travel to a clinic. Through telerehabilitation, medical professionals can electronically consult with patients.

Telecardiology-ECGs (electrocardiograms) can be sent over the phone or wirelessly. Willem Einthoven developed the ECG after testing its transmission through phone lines. This resulted from the hospital's refusal to allow him to bring patients to his lab to test out his revolutionary equipment. In 1906, Einthoven developed a mechanism for transmitting data from the hospital to his lab. To reduce noise in wireless transmission, frequency modulation was applied. Phone lines were also used for transmission. A modulator that changed the ECG output into high frequency sound was used to connect the ECG output to the telephone input. The sound was reconverted into an ECG at the other end using an exact demodulator. The ECG was used to generate sound waves with a frequency range of 500 Hz to 2500 Hz, with 1500 Hz serving as the baseline.

This method was also used to keep track of pacemaker patients in remote areas. The ICU's central control unit was able to recognise arrhythmia in the right way. This method aided in the delivery of medical aid to remote locations.

- Telesurgery-- With remote surgery, also known as telesurgery, a surgeon can administer care to a patient even if they are not physically there. It is telepresence under a different name. Remote surgery incorporates robotics, cutting-edge communication technologies like high-speed data lines, haptics, and management information system components. The majority of these robots are operated by surgeons while they are lying on an operating table, despite the fact that robotic surgery is a well-established field of study. Remote surgery, a sophisticated form of telemedicine for doctors, disregards the physical distance between the surgeon and the patient.

It claims to make it feasible for patients to access the expertise of specialised surgeons without leaving their local hospital. The process of performing surgical procedures using a robotic teleoperator system when the surgeon is not physically present with the patient is known as remote surgery, also referred to as telesurgery. The remote operator may provide tactile input to the user. In remote surgery, robotics and fast data connections are used. The speed, latency, and dependability of the communication link between the surgeon and the patient continue to be a major limiting factor even though trans-Atlantic procedures have been successfully performed.

- Teleophthalmology- is a subspecialty of telemedicine that treats eyes using digital medical tools and telecommunication technologies. The present uses of teleophthalmology include distance learning, remote patient access to eye specialists, and ocular illness screening, diagnosis, and monitoring. Patients with low incomes and those without insurance may benefit from teleophthalmology since it can offer remote, affordable screening exams like those for diabetic retinopathy.

6 Factors Facilitating Telemedicine Development
- Governance
- Policy or strategy
- Scientific development
- Evaluation
7 conclusion

Many health-related contacts will be done 'virtually' via telemedicine technology in the not-too-distant future, culminating in a situation where this mode is the default rather than the exception. Telemedicine is an exciting technology that has the potential to truly alter health care delivery for the betterment of all. As the population continues to increase faster than the number of available skilled clinicians there will be a lack of trained clinicians and facilities, abilities. This technology will need to be optimally exploited to ensure that all persons in need of care are catered to at the very least at acceptable levels, if not better. Telemedicine will increase communication as well as patient satisfaction.

References

3. "TeleHealth". The Health Resources and Services Administration.