

## EVALUATION THE ROLE OF TELEMEDICINE IN PRIMARY HEALTH CARE, LITERATURE REVIEW

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### Abstract

**Background:** Frequent hospital visits can be costly because of transportation expenses, especially in rural areas. In the Covid-19 Pandemic age, telemedicine is preferred by humans as face-to-face interaction becomes unsafe. Thankfully, telemedicine services that utilize videoconferencing or other virtual technology can lessen the need for medical visits.

**Methods:** The Medline, Pubmed, Embase, NCBI, and Cochrane databases were searched for studies of role of Telemedicine in Primary Health Care.

**Conclusion:** By facilitating virtual consultations, telemedicine facilitates changes in lifestyle and eases the burden of office work for both doctors and patients. By lowering barriers to care related to distance and improving appointment convenience, it enhances access to care, particularly in rural areas. Through enabling remote information sharing, providing prompt advice, and reducing travel for both patients and physicians, this technology improves the quality of healthcare.

**Keywords:** Healthcare, Remote treatment, Telemedicine, Virtual appointment

### Introduction

Innovative technology combined with high-quality network services allow people to access

and enhance healthcare for an increasing number of people. Telemedicine is a more advantageous technology that can facilitate people's access to preventive care and improve their long-term health. This is especially true for people who are receiving high-quality care due to financial or local issues. Telehealth has the ability to improve the availability, efficiency, and organization of healthcare. Although research in this field is still in its early phases, it is growing. Longer-term telemedicine use can continue to provide patients with a convenient choice and increase access to primary care, even though telemedicine use increased significantly during the COVID-19 epidemic, mostly due to social distancing initiatives (1). By using telephone or video telemedicine, patients can consult with a doctor without having to deal with scheduling conflicts, missing work, or long wait periods at the clinic. The impact of different telehealth delivery methods on health outcomes may be determined by how well they integrate with regular in-person primary care practitioners (2). Beyond the initial telemedicine related to the pandemic, there is little data to support whether longer-term use of telemedicine visits in clinical practice meets patients' needs appropriately, raises the possibility of follow-up visits, or increases the likelihood that a serious health event requiring an ER visit or hospital stay will occur (3). Previous research has demonstrated the clinical utility of telemedicine for a variety of primary care issues. There is substantial interest in using telemedicine in the long run after the initial pandemic emergency, with broad benefits for patient access to care and continuity of care during the early pandemic period (4). Prior to the pandemic, relatively little telemedicine was used in primary care, and preliminary findings following the outbreak indicated that follow-up care and results were on par with in-person appointments (5). It's still unclear, though, if telemedicine can better handle some clinical issues than others. After the first year of the COVID-19 pandemic, fresh evidence will be required to support telemedicine policy in the context of considerably greater ongoing clinical use due to the fast changes in practice that have occurred recently. Following the initial COVID-19 emergency period, we compared the effects of primary care telemedicine visits and in-person office visits on care processes and post-visit healthcare utilization, both overall and by clinical concern areas. This was done in a large integrated delivery system with mature audio-only (telephone) and video visit telemedicine offerings (6). We predicted that some telemedicine patients would need additional follow-up visits, that serious outcomes would be uncommon, and that outcomes would differ depending on clinical concern areas when compared to office visits. With the use of electronic information technologies and tele-communication, telemedicine provides health-related services. It refers to the entire set of deliverables meant to facilitate communication between patients and their doctors or other healthcare professionals. It offers a wide range of functions, such as remote control, telehealth nursing, online patient consultations, and remote physical and mental health rehabilitation.

### **Features of telemedicine in healthcare management system:**

The many characteristics and resources provided by the telemedicine idea, particularly for the healthcare domain, are reflected in the notion of telemedicine and related services, which have now been well established and proven for societal assistance. This approach is eventually made possible by the chronic health management, prescription compliance, remote services, care for all save the most severe and undercritical cases, etc. that it offers. Furthermore, a range of wearable devices provides patients with healing and unique means of staying informed about their health situation (7). Many refer to telemedicine as disruptive innovation. It is an innovative technology. Therefore, telemedicine uses a variety of electronic communications media, such as picture sharing, teleconferencing, and remote patient surveillance, to cater to a faraway patient. Physicians

can also use automation to provide their patients with high-quality care. They must create more advanced IT support systems and teach new file management techniques for example: Exam results, medical history, X-rays, and other images are transmitted to the expert for review by the physician. The specialist can schedule a virtual meeting with the doctor and respond online. These virtual consultations can cut down on wait periods for specialist feedback, do away with the requirement for needless travel, and eliminate the need for unneeded in-person referrals to specialists (8). Applications for telemedicine offer the potential to expedite the treatment of a number of medical ailments. When a patient receives medication from a licensed physician who has extensive information of their symptoms, the outcome is more favorable. Telemedicine is a way to be in constant communication with both patients and medical professionals. With the utilization of cutting-edge services and technologies, it has increased access to healthcare facilities. Any hospital or treatment facility can instantly access medical personnel, consultants, extra education, and statistics thanks to telemedicine. It's the quickest way to trade all services with any hospital or clinic in the nation. Some decisions and a few simpler requirements may be included in telemedicine application specs (8). Healthcare providers benefit greatly from telemedicine.

Healthcare organizations use telemedicine in skilled nursing facilities and medical offices to provide more efficient services. AI diagnosis, electronic medical records, and medical streaming apps are examples of technologies that when paired with telemedicine software can improve patient diagnosis and management for physicians. This allows doctors to track patients in real time and adjust treatment methods. Physicians can serve more patients with telemedicine without hiring more staff members or adding more space to their offices. But a number of doctors and patients—mostly older adults—are finding it difficult to get used to telemedicine (9).

### **Limitations of telemedicine in primary care:**

When compared to traditional therapeutic approaches, telemedicine has a number of potential downsides. It enhances the healthcare system for certain purposes; it is not a replacement for the current one. Medical data hacking is a severe problem, particularly when a patient connects to telemedicine over an unencrypted route or a public network. This technology can cause delays in emergency care, mostly because a doctor cannot provide life-saving treatment or laboratory tests remotely. Because state laws vary, physicians licensed in one state may not practice medicine in another, depending on the patient's state of residence and the state in which the physician is licensed (10).

Clinicians also need to make sure that the telemedicine service they utilize complies with privacy regulations and is safe, secure, and reliable. In telemedicine sessions, clinicians should concentrate on patient self-reports and ask additional questions to obtain a comprehensive medical history from the physicians. Medication could be at risk if a patient fails to disclose a significant symptom that should have been identified during in-person care. One of the biggest disadvantages is the lack of price and availability. The supplier may find it expensive to start up and operate. For smaller healthcare facilities, telemedicine might be prohibitively expensive, while being a valuable and worthwhile facility. It will also be difficult to deliver trustworthy care if there is poor communication (10).

### **Discussion:**

After the initial pandemic emergency phase ended in 2021, about half of primary care appointments in a sizable integrated health care environment were still telemedicine consultations.

We discovered that prescription drug orders, as well as orders for lab and imaging tests, were most common during office visits and least common during phone PCP appointments. The number of follow-up in-person primary care visits was highest during telephone visits and lowest during index office visits. All visit types had low rates of emergency department visits and hospitalizations; however, the rates were higher following telemedicine than following office visits (11). For instance, variations in follow-up visits were greatest for telephone consultations related to musculoskeletal and abdominal issues, while variations in telemedicine prescribing were most pronounced for pain and gastrointestinal disorders. The particular rates of treatment and follow-up care utilization varied according to clinical problem areas, but there were generally consistent patterns in the disparities between office visits and telemedicine (12). It makes sense that phone consultations might not be able to cover every kind of patient concern as thoroughly as in-person visits. This could lead to a greater requirement for follow-up care in person, especially in cases involving musculoskeletal, abdominal, or skin diseases where physical exam results are very instructive. Significantly, the return rate for differential office visits following telephone visits was only slightly higher, indicating that most patient clinical concern areas could still be addressed by telephone or video telemedicine. In addition, compared to telephone visits, video visits provide greater contact between patients and clinicians and can transmit visual information. This might be part of the reason why video follow-up care use rates are lower than those for phone PCP visits (13). The great majority of telemedicine visits were not followed up with in-person visits, and it is probable that patients and their physicians occasionally use telemedicine visits—especially telephone visits—as an initial point of contact to assess whether extra care is necessary (13).

### Conclusion:

Telemedicine is a useful tool that helps doctors and patients connect so they may make long-term lifestyle changes. It offers substantial advantages to formal office employees. This frequently relieves the strain of patient check-in and allows workers to focus on higher-value duties. With the ability to visit patients online, physicians can provide care for their patients and possibly help other practices that are impacted. By providing the patient and doctor with information regarding diagnosis, treatment, and illness prevention through electronic methods, this also lowers distance barriers. The most comprehensive telemedicine application can bring health coverage closer to residents of rural places where access to high-quality care is otherwise unattainable. This technology has been demonstrated in recent years to improve the quality of healthcare facilities by facilitating the sharing of information across numerous remote places. By increasing access to underserved areas, it becomes easier for people to book and keep appointments.

Individuals with less mobility receive medications and advice from doctors more promptly. They have to oversee medicine, testing, and operations in their place. Telemedicine transforms each patient's life by reducing the amount of time doctors and patients must travel across the globe and by guaranteeing that every patient receives the right medical care.

### References:

- 1- Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Variation in Telemedicine Use and Outpatient Care During the COVID-19 Pandemic in the United States. *Health Aff Proj Hope*. 2021;40(2):349–358. doi:10.1377/hlthaff.2020.01786

- 2- Shi Z, Mehrotra A, Gidengil CA, Poon SJ, Uscher-Pines L, Ray KN. Quality Of Care For Acute Respiratory Infections During Direct-To-Consumer Telemedicine Visits For Adults. *Health Aff Proj Hope*. 2018;37(12):2014–2023. doi:10.1377/hlthaff.2018.05091
- 3- Carrillo de Albornoz S, Sia KL, Harris A. The effectiveness of teleconsultations in primary care: systematic review. *Fam Pract*. Published online July 19, 2021:cmab077. doi:10.1093/fampra/cmab077
- 4- Callaghan T, McCord C, Washburn D, et al. The Changing Nature of Telehealth Use by Primary Care Physicians in the United States. *J Prim Care Community Health*. 2022;13:21501319221110416. doi:10.1177/21501319221110418
- 5- Reed M, Huang J, Graetz I, Muelly E, Millman A, Lee C. Treatment and Follow-up Care Associated With Patient-Scheduled Primary Care Telemedicine and In-Person Visits in a Large Integrated Health System. *JAMA Netw Open*. 2021;4(11). doi:10.1001/jamanetworkopen.2021.32793
- 6- Reed ME, Parikh R, Huang J, Ballard DW, Barr I, Wargon C. Real-Time Patient–Provider Video Telemedicine Integrated with Clinical Care. *N Engl J Med*. 2018;379(15):1478–1479. doi:10.1056/NEJMc1805746 [PubMed: 30304654]
- 7- W. El-Shafai, F. Khallaf, E. S. El-Rabaie, F. E. AbdEl-Samie, Robust medical image encryption based on DNA-chaos cryptosystem for secure telemedicine and healthcare applications, *Journal of Ambient Intelligence and Humanized Computing* (2021 Mar 26) 1–29.
- 8- E. Eisenstein, C. Kopacek, S. S. Cavalcante, A. C. Neves, G. P. Fraga, L. A. Messina, Telemedicine: a bridge over knowledge gaps in healthcare, *Current pediatrics reports* (2020 Jul 1) 1–6.
- 9- B. Rao, A. Lombardi 2nd, Telemedicine: current status in developed and developing countries, *J. Drugs Dermatol. JDD: J. Drugs Dermatol. JDD* 8(4)(2009 Apr 1) 371–375.
- 10- Haleem, A., Javaid, M., Singh, R. P. and Suman, R., 2021. Telemedicine for healthcare: Capabilities, features, barriers, and applications. *Sensors international*, 2, p.100117.
- 11- Shi Z, Mehrotra A, Gidengil CA, Poon SJ, Uscher-Pines L, Ray KN. Quality Of Care For Acute Respiratory Infections During Direct-To-Consumer Telemedicine Visits For Adults. *Health Aff Proj Hope*. 2018;37(12):2014–2023. doi:10.1377/hlthaff.2018.05091
- 12- Juergens N, Huang J, Gopalan A, Muelly E, Reed M. The association between video or telephone telemedicine visit type and orders in primary care. *BMC Med Inform Decis Mak*. 2022;22(1):302. doi:10.1186/s12911-022-02040-z [PubMed: 36403030]
- 13- Farzandipour M, Nabovati E, Sharif R. The effectiveness of tele-triage during the COVID-19 pandemic: A systematic review and narrative synthesis. *J Telemed Telecare*. Published online January 23, 2023:1357633X221150278. doi:10.1177/1357633X221150278