

Telemedicine and Cancer Care in Low- and Middle-Income Countries During the SARS-CoV-2 Pandemic

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Introduction

The multifaceted impact of the SARS-CoV-2 pandemic has stretched health services to a great extent, and cancer care is not an exception. With the imposition of lockdowns and movement restrictions in most countries, all aspects of cancer care, including screening, diagnosis, treatment, palliative care, and follow-up, have been compromised because of the pandemic.¹ Curtailment of regular clinical activities because of the lockdowns has not only created a backlog of patients with cancer needing immediate care but has also affected the supply chain of anticancer drugs, delayed essential surgeries, and disrupted the therapy protocols. Cancer is emerging as an important comorbidity associated with a high rate of intensive care admissions following infection with SARS-CoV-2.² Hence, cancer care is further complicated because of the vulnerability of patients with cancer to SARS-CoV-2, during and after treatment. The pandemic has also taken a heavy toll on the mental health of patients with cancer and their caregivers, as reported by Ng et al.³

The low- and middle-income countries (LMICs) are already burdened by common cancers like breast, oral cavity, cervical, gastric, and lymphomas. Not surprisingly, countries with fragile or fragmented health services have seen dramatic effects on the cancer care continuum (preventive, diagnostic, therapeutic, and survivorship care) during the pandemic. A recent cross-sectional study among 17 LMICs showed that cancer diagnostic services were completely withheld for 30 days or longer in eight (47%) of them, whereas six (35%) countries reported complete suspension of cancer treatment for longer than a month.⁴ Vaccination against human papillomavirus has been badly hit because of temporary stoppage or deprioritization of existing programs and delayed introduction of new programs.⁵

However, the SARS-CoV-2 pandemic has also created an opportunity to adopt and adapt technological solutions to mitigate some of the negative impacts. Digital technologies provide concrete opportunities to tackle health system challenges, and thereby offer the potential to enhance the coverage and quality of health practices and services.⁶ Telemedicine is one such

solution that harnesses the power of the digital revolution and the high penetration of mobile telephones across the world. Teleoncology is a branch of telemedicine to improve cancer patients' access to care by reducing the need to travel to distant tertiary-level oncology centers.⁷ This can reduce the workload on oncologists and help hospitals to prioritize services. According to the mode of communication, telemedicine may include video (streamed on mobile phones, tablets, and computers using special software), audio (phone and voice over internet protocol), text, or hybrid methods.

The beneficial role of teleoncology, ranging from the counseling of patients to capacity building of health professionals and researchers, has been demonstrated during the pandemic even in LMICs. The advantages of telemedicine or teleoncology include convenience, safety, a decrease in health care costs by reducing just 1% of emergency department visits through the use of telemedicine,⁸ and increased access to care from a distance, especially for patients in rural areas.⁹ It can also reduce geographical inequities in access to health care services in many LMICs, where cancer care specialists are often concentrated in cities.¹⁰ The role of telemedicine cuts across cancer sites. Teleconsultation is particularly beneficial for those at higher risk of infection (elderly, having comorbidities, and immunodeficient).¹¹

In this commentary, we describe the possible roles of telemedicine to improve services across the cancer care continuum in LMICs, challenges of equitable implementation, and possible strategies to overcome these challenges.


The role of telemedicine along the continuum of cancer care:

Opportunities. The application of telemedicine, including m-Health, to improve the efficiency, efficacy, and reach of interventions across the cancer care continuum has received a tremendous boost during the pandemic. The role of teleoncology to improve cancer care is described in the following sections:

1. Cancer prevention, early detection, and treatment: Telemedicine could compensate for the

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deficiencies of the health care workforce and infrastructure in LMICs. The use of mHealth in tobacco control is an example.¹² Mobile phone-based tobacco cessation (mCessation) interventions are effective in high-income countries; however, their effectiveness in LMICs is being evaluated.¹³ Rubagumya et al¹⁴ concluded that smartphone-based mobile platforms may be used for teleconsultation approaches to improving the cancer screening community.

Another randomized controlled trial conducted in Bangladesh demonstrated that the smartphone-empowered community health worker model of care for breast health promotion, clinical breast examination, and patient navigation in rural areas was more efficient and effective in breast health promotion compared with the control group.¹⁵

The European Society for Medical Oncology recommends the use of telephone and web technology for toxicity evaluation, dose adaptation, and supportive care recommendation during the COVID-19 pandemic.¹⁶ Telemedicine may be useful in reducing personal outpatient appointments for post-treatment follow-up during the COVID-19 pandemic.¹⁷ It can facilitate cancer management by providing remote chemotherapy supervision, symptom management, and palliative care as well as psychological support.¹⁸ Lewis et al¹⁹ concluded that follow-up of patients with cancer in the long term can be complemented by the use of telemedicine services. Beyond the SARS-CoV-2 pandemic, telemedicine-based care may be considered for patients receiving long-term oral therapies or active surveillance.²⁰

Several recent studies demonstrated that patients with cancer receiving palliative care favored telemedicine visits and attributed their preference to the increased comfort and safety of their homes.^{21,22} Importantly, these visits allowed personalized care, improved quality of life,^{23,24} and instilled greater confidence and support to patients' family members.²⁵

All these examples demonstrate that telemedicine can effectively help in improving the preventive, promotive, palliative, and, to an extent, curative aspects of health care.

2. Clinical decision support: Telemedicine has applications in decision making as well as counseling the patients and their relatives during treatment planning. Ensuring SARS-CoV-2-free status of patients while undergoing cancer treatment is crucial, and telemedicine may help physicians to evaluate the need for SARS-CoV-2 testing before initiating treatment.²⁶ Feedback from stakeholders suggests increasing satisfaction with the transition from physical to virtual tumor

boards, which can also work toward supporting hub-and-spoke models of care and facilitate multidisciplinary coordination.²⁷

3. Capacity building, research, and clinical trials: The use of telemedicine for capacity building during SARS-CoV-2 times has been efficiently demonstrated in a study conducted at the All India Institute of Medical Sciences, New Delhi. All India Institute of Medical Sciences worked with the telementoring platform Extension of Community Health Outcome, India, to conduct a national training session on ventilatory management of SARS-CoV-2 and trained more than 5,000 health care professionals. The virtual training session enabled doctors across the country to better manage patients with SARS-CoV-2 suffering from respiratory issues.²⁸ In a study from China, the implementation of telemedicine services decreased the death rates and incidences of SARS-CoV-2 by providing prevention, treatment guidance, training, communication, and remote consulting for the community residents and medical staff and, thus, played a considerable role in controlling the SARS-CoV-2 epidemic.²⁹ The lockdown because of the SARS-CoV-2 outbreak derailed cancer research activities around the world. Laboratories were shut, and ongoing experiments and clinical trials in oncology were halted because of inadequate recruitment and retention of patients. It resulted in a catastrophic loss to patients and researchers. It also resulted in the diversion of resources to contain the SARS-CoV-2 pandemic, which will lead to a funding crunch in near future.^{30,31} A study suggests that telemedicine may have an important role in monitoring patients included in clinical trials during the SARS-CoV-2 pandemic.³²
4. Other benefits: An unexpected benefit of virtual learning in the pandemic era is a significant increase in academic conference attendance, with more participants joining from Asia and Africa who, previously, might have had difficulty attending in-person meetings because of geographic or financial constraints. With better learning opportunities for clinicians and health care professionals from developing countries, these virtual meetings can greatly improve cancer care in these underserved regions. In addition, Elkaddoum et al³³ reported that teleoncology helps in reducing the demand for COVID-19-related personal protective equipment. It has also been well documented that psychiatric consultation through telemedicine while staying at home can be effective in providing care for patients with mental health conditions, which have been exacerbated during the pandemic.³⁴

TABLE 1. Challenges and Recommended Solutions

Sr. No.	Challenges	Impact	Recommended Solution
1	Inequity in access to care	Access to digital communication facilities can vary by sex, age, geographical location, education, and economic status, and thus, the reliance on digital technologies can hugely augment inequities in access to cancer care. ³⁵⁻³⁷ Not all patients have smartphones or can schedule telemedicine appointments. ³⁸ Although telemedicine has been proven to improve health care delivery of users even in LMICs, pre-existing socioeconomic disparities within the population of LMICs may widen health inequalities between users and nonusers of telemedicine services ³⁹	It is important to empower the patients so that they can use telemedicine services. Creating handouts or standard operating procedures on best practices for telemedicine and other educational resources can ease patients' anxiety and enhance their experience with telemedicine visits. ⁴⁰ But these need to be made available online before the teleconsultation begins or may be shared on the hospital website for patient information. It may also be incorporated into the patient education and/or navigation plans. Studies from India have reported that low levels of literacy and health literacy are not a hindrance as patients can send images of medicines, prescriptions, and laboratory or imaging test results, even if they live in very remote areas. This could be achieved with proper planning and patient empowerment. ⁴¹ Provision of cheap mobiles and internet connectivity plans and basic mobile operating awareness sessions may help in improving the reception of the telemedicine services from the patient's side
2	The financial constraint to telemedicine implementation	The cost of internet subscriptions is relatively higher in LMICs compared with developed countries. ⁴² There are costs to set up and maintain the technology and devices that are used for telemedicine, eg, cost to providers or the system to build apps needed to keep patient information organized and private. There is a cost involved from the patient's side as well, eg, cost to the patient to have a phone. Despite promising impacts of mHealth in improving outpatient management, especially for chronic diseases, a significant percentage of the population in LMIC still lack access to mobile phones that are sophisticated enough to access these mHealth services ⁴³	To counter financial constraints to telemedicine implementation, improving internet connectivity and broadband bandwidth with coverage even in remote areas along with innovative mobile apps and their future expansions may be incorporated into patient education and/or navigation plans. These approaches have a high likelihood of fully realizing the potential of their screening technologies. ⁴⁴ All these objectives can only be achieved by improving the overall infrastructure
3	Reimbursement shortfall	There are variations in reimbursement policies across regions and health care systems. One of the major barriers is harmonizing a standard reimbursement policy that is acceptable to all stakeholders and is sustainable ⁴⁵	An integrated framework involving public and private parties could help develop a less complicated and streamlined reimbursement structure ⁴⁵
4	Patient perspectives	The perspectives of the patients and their informed choice regarding the adoption of teleconsultation may also be quite variable across different sociocultural groups. Kitamura et al reported that some patients felt nervous and anxious to use the new technology. They also reported difficulty or reluctance to communicate with providers using internet-based systems ⁴⁶	Aside from procurement and availability of evenly distributed infrastructures, the design process for telemedicine innovations should include community engagement of prospective users. ⁴⁷ This should include effective collaborations with community leaders, health professionals, academic institutions and educators, health administrators, and policymakers in the locality to ascertain the societal needs ⁴⁸
5	Provider's perspectives	Because of the rapid implementation of telehealth during the SARS-CoV-2 pandemic, physicians had little time to learn to optimize their virtual visits and maximize their efficiency and effectiveness. There is a steep learning curve before such virtual consultations become fruitful, which is influenced by a variety of factors on both the patient's side and the physician's side. ⁴⁹ The capacity of the health professionals to learn the new technology and use it appropriately may be highly variable. Tashkandi et al ⁵⁰ reported that nearly 50% of oncologists surveyed in the Gulf countries preferred in-person v virtual prescription of chemotherapy and 48% were hesitant to prescribe novel immunotherapy virtually	Need for the training of health care professionals: Appropriate training and education of health care professionals, including communication skill workshops for health care providers, is warranted ⁵¹
6	Data privacy and commercial players	A major concern during the rapid adoption of telemedicine is the protection of privacy of patient data. Professionals need to be appropriately guided to select telehealth-appropriate services. ⁵² Telemedicine must be performed using a secured internet bandwidth and security-certified platform, ensuring physician-patient confidentiality. ⁵³ Triantafyllou et al ⁵⁴ highlight the scarcity of guidelines on oncologic surveillance over the phone or video in subspecialties like head and neck cancer. Concerns about online security and privacy mandate effective measures by all stakeholders, including technology companies, to step up efforts in this direction	Framework or guidelines and legislation: To counter the issue of data privacy and regulate the commercial players, a national regulatory and legislative framework on the use of telemedicine is essential. The oncology societies may engage with the information technology departments and regulatory authorities, and draft guidelines should be made available to all health professionals as well as patients. Many governments and professional societies are working out reimbursement models to compensate health professionals while supporting to train professionals to use technology appropriately and efficiently. ^{16,55} A WHO document on digital interventions for health system strengthening provides guidelines for the establishment of standard operating procedures for ensuring patient consent, data protection and storage, and verifying provider licensing and credentials are available. ⁶ Dash et al ⁵⁶ have suggested that telemedicine guidelines must be expanded to address ethical concerns about the use of privacy, patient data, and its storage

Abbreviations: LMICs, low- and middle-income countries; Sr, serial.

Challenges. However, there are several implementation challenges associated with the use of teleoncology that need to be considered before the benefits of telemedicine might be fully realized in any setting. The details of such challenges, their impact, and recommended solutions are described in [Table 1](#).

Additionally, an important obstacle could be the impossibility of carrying out an appropriate clinical examination from a distance, knowing that the routine clinical practice often reveals early signs that could lead to new investigations.³⁰ The challenges associated with real-time evaluation and loss to follow-up remain one of the key drawbacks.

Newer initiatives

1. Leveraging the social media: Conventional telemedicine requires the physical presence of the patient at a nearby telemedicine center. This is where social media can fill the gap by providing continuity of care without a physical visit.⁵⁷ The authors have conducted a longitudinal trial on the use of the SoMe (social media) application for remote monitoring of patients with cancer, and it was as effective as a conventional follow-up. It is imperative that while providing clinical care via SoMe, physicians should have the ability to balance principles of privacy in these settings.⁵⁸

2. The Indian Government recently launched an online consultation service via *E-Sanjeevani*, a nationwide online medical services platform. This teleconsultation service enables patients to consult with specialist doctors from the safe confines of their homes. The service is particularly helpful in the present scenario as India is experiencing the second wave of the largest pandemic of the century.⁵⁹

In conclusion, technology, if used appropriately, has the potential to mitigate some of the challenges posed by the SARS-CoV-2 pandemic in the equitable provision of quality cancer care and control. New telemedicine-promoting policies and ubiquitous mobile phone access in many LMICs now raise the possibility that telemedicine could help bridge gaps in care for chronic medical conditions including cancer. However, a proper code of conduct has to be followed and guiding principles framed for patients and health care providers in the online world. There is also an urgent need to provide proper training to the patients as well as the health care providers to use telemedicine to yield optimum results. Going forward, a hybrid approach may be the order of the day, and the per-force adoption of technology may prove to be a blessing in disguise, not only saving time, expense as well as a step toward universalizing access to health care.

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Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians ([Open Payments](#)).

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