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Review Article

Telemedicine in Paediatric Health Care

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Abstract:

Technology-enabled telemedicine is improving children's health worldwide. This article documents how paediatricians are using telemedicine to provide inpatient and outpatient care, patient and physician education, and research. It discusses the value of telemedicine in responding to crises and disasters and providing access to paediatric care to underserved and isolated communities. Legal issues, inadequate payment for services, cost and sustainability of technology, and lack of national technology infrastructure are some of the barriers to the development of telemedicine.

Key words: Telemedicine, Teleconsultation, Telemonitoring, Paediatric Health Care

Introduction:

Changing public health needs require organizational restructuring of service networks, particularly with the aim of enhancing coverage of care areas.[(1)] Technological innovations can help restructure care structures, particularly by shifting the focus of carefrom hospitals to communities through new citizen-centered care models that facilitate access to services in the community.[(2-4)] The delivery and social care services via telemedicine is fundamental in this sense. It helps to provide equitable access to care in remote areas, support for chronic disease management, access to highly specialized care continuity through multidisciplinary comparisons, and basic care for emergency services.[(5, 6)]

Currently, 45% of the population is connected to the Internet and 79% to a mobile phone.[(7)] The availability of cost-effective Internet connectivity has further increased the use of telemedicine services. Telemedicine has enabled health professionals to reach people in remote areas of the country.

India reported its first case of COVID-19 on 31 January 2020, and a lockdown was declared on 24 March 2020. During the quarantine, health facilities focused on caring for COVID- 19 patients. Outpatient services were closed. Additionally, travel restrictions disrupted routine health care services and follow-up care for patients with chronic, mental, and neurological conditions.(8) India issued its first national telemedicine guidelines on 25 March 2020 in response to the health crisis caused by the pandemic. Telemedicine enables healthcare professionals and frontline community staff to triage paediatric patients, refer for emergency services, treat minor illnesses, order tests, obtain reports, perform follow-up consultations, provide health education on appropriate COVID behavior, conduct research, and gain access to continuing medical education (CME) programs and clinical protocols. The use of telemedicine has reduced hospital traffic, thereby reducing the exposure of healthcare workers and non-COVID patients to COVID infections.

The World Health Organization (WHO) defines telemedicine as the use of information and communication technologies to provide health services where distance is a factor by enabling healthcare professionals to exchange reliable information for the diagnosis, treatment, and prevention of disease and injury; for research and evaluation; and for continuing education of health care providers interested in improving the health of people and communities.

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Disease control, health promotion, research, and medical education fall within the scope of telemedicine. Telemedicine is a critical of the WHO Digital Health Strategy 2020-2024 to promote equitable and universal access to health services, personalized care, and emergency preparedness.[8, 9]

1. Telemedicine Use:

Paediatricians can use telemedicine for a wide range of applications. Telemedicine can be used for distance education, teleconsultation and tele-research. Remote education can be provided through interactive real-time AV links, live video streaming, and viewing of archived educational materials. Remote education programs allow physicians to stay current, reduce travel for continuing medical education (CME), receive free CME, develop relationships with academic and community physicians, and create a broad peer group to learn from each other and from the academic community.[10,11]

Teleconsultation typically involves establishing a communication link between a physician requesting advice on a patient he or she is seeing and a specialist at a remote medical center. These consultations can be conducted via direct interactive AV communication or via store-and-forward technology. For example, a remote cardiologist may store echocardiographic images for immediate interpretation, although they cannot be read in real time. Teleconsultation is well suited to the management of both acute and chronic conditions.[12-17]

The benefits of teleconsultation include improved access for medically underserved individuals, improved access for children in rural and urban are and improved treatment through faster and more accurate assessments. Teleconsultation can reduce costs for the health care system and the patient's family. Teleconsultation involves establishing a connection between a physician and a patient in a daycare centre, kindergarten, school, or juvenile correctional facility. Teleconsultation does not replace in-person visits, but rather complements them. Benefits of this connection include improved health care facilities with private doctors to care for the children; reduced costs for the health care system and reduced school absences for children; reduced travel costs for parents; less time away from work for parents; and reduced emergency room overcrowding.[12, 18-21]

Tele-research involves disseminating translational research from academic centres to primary care physicians, using telehealth to expand the research population base, and improving collaboration among researchers within and across institutions. Rapid dissemination of translational research results is a national priority.[22] Telehealth provides an excellent tool for this rapid dissemination.[11] The use of telehealth as an important way to deliver health care has been and is expected to continue to grow. Technological advances are increasing the number of tools available for telehealth and reducing the cost of these tools. In addition, government forces, such as legislation mandating reimbursement for telehealth, will further accelerate the development of telehealth.[12, 18, 20-24]

2. Tele-Education:

Provider Education Live AV links create a virtual classroom, allowing teachers and students to interact in real time from a distance. These links have been used to connect academic medical centre physicians with community physicians and to provide relevant and cost-effective continuing medical education to local health care providers. Discussions allow students to ask questions, allowing teachers to better follow adult learning principles when creating academic and primary care virtual peer groups.[25] One-way streaming video links work well, but they do not work as well as live AV links because of the limited interaction between teacher and student. Students can view presentations in real time from their remote lecture locations, but the instructor cannot see or hear them. However, students can send instant messages to ask questions and provide feedback, which the instructor can relay to local and remote audiences.[10, 11]

3. Telemedicine at home:

In cases where proximity between the patient and the primary care provider is extremely difficult, if not impossible, due to a variety of reasons (e.g., disability, quarantine due to infectious diseases, significant distances between home and outpatient clinic, extreme climate impermeability), the patient's home should be the first choice for prevention and treatment. In this regard, it is necessary to develop clinical, organizational, and administrative management tools, such as the development of digital systems and platforms that allow real-time sharing of information about the care recipient. This includes the adoption of a uniform multidimensional scoring system that can measure frailty status, develop prognostic indicators, and assess the intensity of care that an individualized treatment plan should provide to the patient.[26]

4. Emergency situations:

Telephone triage is an essential tool for determining the need for direct clinical assessment and the urgency and setting of treatment. This allows us to reduce the number of unnecessary visits using specific forms (questions to identify red flags) and optimize available local resources in terms of time and personnel.[27] Develop pediatric telephone screening guidelines that specify specific factors that should be assessed by telephone and that specify urgently needed forms to standardize access to health care and hospital care nationwide. Organizational models should provide families and paediatricians in the area with rapid access to emergency response centres where qualified personnel can effectively (remotely) manage the first and most sensitive phase of emergency intervention.[28, 29]

5. Teleconsultation and telephone monitoring:

Teleconsultation and telephone monitoring are now widely available and can be appropriately developed and improvement of communication systems that allow for the rapid exchange of video calls, images, audio.[30] Furthermore, technology systems that can collect and transmit essential data like heart rate etc.) for better remote assessment are already available and implemented on the market

Conclusion:

Despite the wealth of recent research describing the increasing use of telehealth, important gaps remain in the field. There is an opportunity to better understand the role of telehealth in education and training: how to best optimize clinical workflows, how telehealth can improve patient assessment and treatment, and how telehealth can best be used to support family-centred care. Educational resources that include up-to-date evidence on paediatric telehealth visits are needed. The presence of such resources can promote consistency across providers in addition to increasing provider confidence and quality of care. Special attention should be given to ensuring that these resources are updated as data in this rapidly growing field change. Data collected from patients, including remote physiological monitoring, can improve the quality of virtual visits, but issues related to measurement quality and parental self-efficacy must be addressed. Rigorous research examining specific practices of telehealth delivery and use is needed to develop evidence-based recommendations for virtual care for paediatric conditions. Implementation science methods and frameworks can be applied to identify and test these practices. Finally, it is important to focus on equity to ensure that telehealth interventions do not increase health disparities.

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