



International Journal of Bioanalysis & Biomedicine

Review Article

Telemedicine in Pediatric Neurology Clinic during the COVID Era and the Inherent Challenges -

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Submitted: 02 March 2022; **Approved:** 11 March 2022; **Published:** 12 March 2022

Cite this article: Iqbal S, Rashid FS, Ayodele Blair KA, Sarwar MZ, Afridi M, Iqbal Ahmed SS, Khalil I, Aleem H, Medvid T, Iqbal N. Telemedicine in Pediatric Neurology Clinic during the COVID Era and the Inherent Challenges. Int J Bioanal Biomed. 2022 Mar 12;3(1): 001-004.

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ABSTRACT

The ongoing COVID-19 challenge has upset the social, economic and health care system around the globe. Because of this pandemic, social distancing measures have been strictly implemented creating a profound stress on health care services. Telemedicine is an advancing and a timesaving means for emergency as well as non-urgent patient assessment. In this pandemic era, telemedicine has provided humanity with an alternative tool for provision of suitable clinical care within the short and safe therapeutic time window.

Telemedicine can be defined as “the implementation of telecommunication technologies to dispense medical information and services” and “the exercise by which electronic, visual, and audio communications are used to furnish diagnostic and consultation pathways to reinforce clinicians at distant sites, assist in or directly deliver medical care to patients at distant sites, and enhance the skills and knowledge of distant medical care providers.”

There are many advantages of virtual health, for instance, the ability of both patient and health care provider to remain at distance, more convenience, and diminished cost. Recently, a successful adaptation of virtual adult and pediatric neurology outpatient care has been studied by various centers in the world during the pandemic. A high degree of contentment was observed among the health care providers, and a lower rate of face to face encounters while using the virtual clinic visit.

Keywords: COVID-19; Pandemic; Pediatric; Neurology; Clinic; Telemedicine clinic

INTRODUCTION

The ongoing COVID-19 challenge has upset the social, economic and health care system around the globe. Because of this pandemic, social distancing measures have been strictly implemented creating a profound stress on health care services. Telemedicine is an advancing and a timesaving means for emergency as well as non-urgent patient assessment. In this pandemic era, telemedicine has provided humanity with an alternative tool for provision of suitable clinical care within the short and safe therapeutic time window [1-3].

Telemedicine can be defined as “the implementation of telecommunication technologies to dispense medical information and services” and “the exercise by which electronic, visual, and audio communications are used to furnish diagnostic and consultation pathways to reinforce clinicians at distant sites, assist in or directly deliver medical care to patients at distant sites, and enhance the skills and knowledge of distant medical care providers” [4-6]. There are many advantages of virtual health, for instance, the ability of both patient and health care provider to remain at distance, more convenience, and diminished cost [7-9]. Recently, a successful adaptation of virtual adult and pediatric neurology outpatient care has been studied by various centers in the world during the pandemic. A high degree of contentment was observed among the health care providers, and a lower rate of face to face encounters while using the virtual clinic visit [6-10].

Telemedicine in pediatric neurology care has been reported less frequently as compared to adult stroke virtual clinics, specific disease populations such as epilepsy and headache. In this review, we analyzed the feasibility of implementation of telehealth medicine in pediatric neurology care. The potential of audio-video telemedicine encounters in pediatric neurology patient care and feasibility of incorporation of telehealth services into post-pandemic pediatric neurology clinic [7-11].

Reports of pediatric neurology telemedicine delivery have been limited to programs for underserved populations.

METHODS

We did search on PubMed, Medline database publications using: COVID-19, Pediatric clinic, telemedicine clinic, neurology. The publications included were special communications, reviews, conferences papers, books and research studies regarding the subject matter over last two years.

DISCUSSION

In the past 2 years, the COVID-19 pandemic has strained social, economic, and health care systems around the world. There had been an enormous effect on all specialty clinics, including neurology services due to the implementation of strict social distancing policies. Cancellations of the interventional procedures and the outdoor clinic visits were the results [7-10]. Owing to the safety concerns to health care workers and the patients alike, hospitals were in desperate search of new clinical pathways and technology gadgets during this crisis for maintaining the safety of the health care personnel and patients [9-10].

The Centers for Disease Control and Prevention has endorsed the concept of telemedicine in lieu of live clinic visits due to the anticipated uncertain duration of lock downs and social distancing [9-11]. In adult neurology clinic, Telemedicine has proved to have a precious role in emergency stroke consultation. Neurologists can swiftly evaluate and supervise the management of stroke patients by utilizing telemedicine and can help the remote physicians at the health units at distance. [9-12].

Rametta, et al. [13] shared their experiences regarding the utilization of telehealth services for outpatient child neurology care. They noticed, the satisfaction felt by the health care providers while using telemedicine for almost all virtual encounters with the children in need of neurology care. When asked further if they would choose to utilize telemedicine mode again? They opted for the ongoing use of telemedicine for the majority of the patients. Although the healthcare personnel reported few technical issues in about 33% of virtual visits, they still did not face much difficulty in providing services to the patients in need. Additionally, the majority of parents of the children also showed satisfaction regarding the telemedicine visits keeping in view the social distancing measures in the current pandemic.

Telemedicine for remote health care services include gadgets such as audio and video instruments [13,14]. This mode of health care diminishes the risk of pathogen exposure. Telemedicine, owing to accessibility, ease, maintaining high patient and family contentment: allows patient-centered care. One of the main advantages of telemedicine includes timely care by evading cancellations or delays in the provision of care during the current pandemic. Another positive aspect of telehealth services is averting the burden on health care providers or families of children in terms of travel and time requirements inherently linked with an in-person visit [13-15].



Danger of catching COVID infection is more in indoor activities. Contamination of surfaces was more frequent (in indoor datasets) compared to contamination of air samples; however, the average positivity rate was lower compared to that of air. Concentrations of SARS-CoV-2 RNA in air were highly variables and, on average, lower in outdoors compared to indoors. Among indoors, concentrations in community indoors appear to be lower than those in hospitals and healthcare settings [16].

In various studies, the observation of a high degree of contentment with the telemedicine process suggests that this model of health care provision is maintainable during and after the current pandemic. It is important to note that technical problems such as software updates and bandwidth expansion may arise. These are secondary to the enormity of data traffic across the hospital's networks. Despite these facts, many health care personnel have indicated that they would opt to continue telehealth even beyond the current pandemic if given the opportunity [12-15].

Findings in recent literature have shown that remote history taking and virtual examinations are efficacious for catering to pediatric neurology care. Other advantages of telehealth services in pediatric neurology were the removal of barriers to care linked with in-person encounters. The barriers observed in the case of underserved patients whose parents find it difficult to miss work or bear the extra costs of travel to the hospital in person, who live at quite a distance from health care facilities, or who have complex transportation needs. However, it is pertinent to note that there were some disparities in the provision of telehealth care to patients in racial and ethnic minority groups. They were the ones who were less likely to have access to the potentially more efficacious care that telemedicine encounters can provide compared to telephone encounters [14-16].

More research is needed regarding the implementation of telemedicine in pediatric neurology including the prospective studies to gauge patient-centered outcomes. Moreover, firm evaluation of the effects of distant monitoring technologies, including devices for detection of seizures, long-term remote EEG monitoring and introduction of electronic pillboxes, and actigraphy (a non-invasive technique used to assess cycles of activity and rest over several days to several weeks) might further strengthen the foundation for future use of telehealth services [17-20].

There are some challenges in certain neurological consultations that are less amenable to a virtual examination, such as concern for myelopathy or cauda equina syndrome in which formal strength, reflexes, appendicular and rectal tone, and saddle anesthesia are critical maneuvers that cannot be assessed by virtual interaction with patients. The quality of each patient-physician virtual interaction is unique. Moreover, it is affected by various factors such as type of neurological complaint, the efficiency of gadgets utilized, the patient's ability to handle the camera and compliance with instructions, and the involvement of a third party to help in the examination [19-23].

In recent literature, it was suggested that it is vital to promote the implementation of tele-neurology. There is a need to direct efforts towards enhancing the realization of its advantages and creating an atmosphere of organizational and infrastructural support. At last, qualitative research pertaining to individual experiences regarding the practice of tele neurology is also advocated [21-23].

CONCLUSION

In the light of challenges posed by the current pandemic,

implementation of telehealth visits in pediatric neurology (audio-video telemedicine encounters) have satisfactory outcomes. However, in a few patients, in-person follow-up is required. Further research is needed regarding the feasibility of implementing telehealth pediatric neurology clinics for a larger proportion of children across the globe to continue continued care even in the situation of pandemics.

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