Tele-rehabilitation for persons with vision impairment during COVID-19: Experiences and lessons learned

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Purpose: The COVID-19 pandemic imposed challenges to access rehabilitation intervention to individuals with visual impairment, thereby increasing their disability effects. This study explored the viability of maintaining the continuum of care through telerehabilitation. Methods: This study is a retrospective analysis of individuals with vision impairment who underwent telerehabilitation at the center of excellence in eye care at Hyderabad, Telangana, India, between April and September 2020. The International Classification of Functioning, Disability and Health framework was followed to provide services such as counseling for mental well-being, information and resources, educational interventions, Assistive Technology programs, therapeutic interventions for children with multiple disabilities, access to digital audio books and rehabilitation helpline. A team of professionals involved in the service care. Phone and what’s app calls were used to facilitate the training. The duration and the number of training sessions were individual need-based with an average of 45 minutes per session and 175 training sessions. Results: Three hundred and fifty individuals and their families benefited. The service include early intervention (n = 129), and low vision care (n = 176) inclusive of computer training (n = 53), soft skills (n = 53), digital books (n = 55). Nearly two-thirds of the participants were male (n = 205). Conclusion: Evidence from this study suggests telerehabilitation as a successful model of care. A well-planned telerehabilitation approach can expand the scope of reaching the visually impaired from geographically isolated areas where scarcity of service providers and service centers.

Keywords: Telerehabilitation, vision impairment, COVID-19

The World Health Organization (WHO) declared the outbreak of a COVID-19 respiratory disease as a global pandemic on January 30, 2020.[1] This situation called for a worldwide shutdown of several activities. In India, the virus spread demanded the nationwide lockdown on March 24, 2020. The lockdown experience was challenging for larger sections of the society, especially for people with vision impairment with their compounded vision-related difficulties such as accessing public transportation, maintaining physical distance, taking sighted guide’s assistance, and so on.[2-4] The most critical of all challenges was the loss to the continuum of rehabilitation care resulting from a halt in progress.[5] The continuum of care is essential to enhance further development or prevent deterioration in gained functions.[6] Especially for children with special needs, the reduced exposure to therapeutic interventions when the brain is primed for neurological recovery poses a risk for worsening their disability further.[7-9] Overall, the COVID-19 has created a new burden on patients, families, and healthcare workers.[3,10,11]

Given the situation, to meet the daily living and rehabilitative needs of people with disabilities, the WHO have urged for innovative considerations from governments, healthcare systems, and disability service providers. The recommendations included providing telephonic consultation, text messaging, and video conferencing to deliver health and rehabilitation care for people with disabilities as appropriate.[12]

Responding to this, several organizations[4,13-15] explored newer modalities of rehabilitation care such as webinars, helplines, counseling cells, and tele-rehabilitation. A collaborative partner of WHO, an institute of excellence in eye care, Hyderabad, South India, is one such organization that contributed to the call by initiating a tele-rehabilitation model to reach out to its beneficiaries.

The institute has the background of a well-established vision rehabilitation center as an integral part of its clinical care.[16] The comprehensive rehabilitation services offered range from low vision care to social, educational, and vocational rehabilitation through training or re-training patients with low vision and blindness to the highest possible
level of functional ability. In addition, these services are effective to those in the community who cannot access the services through community-based rehabilitation services. The concept of tele-rehabilitation was an added component initiated in April 2020, with an emerging need to provide the best, safest care possible to those in the greatest need. The establishment of tele-rehabilitation during lockdown was published earlier. The present paper brings an insight into the impact of virtual rehabilitation through the results analyzed from this model of care.

Methods
This study is a retrospective analysis of 305 individuals with vision impairment who underwent tele-rehabilitation at the center of excellence in eye care at Hyderabad, Telangana, India, between April and September 2020 [Fig. 1]. The vision impairment was classified by ICD-10; however, instead of presenting visual acuity, the functional definition of best-corrected was considered from the service point of view (Reference WHO). Furthermore, tele-rehabilitation was limited to only those follow-up patients already undergoing rehabilitation training at the center and could not continue services because of imposed pandemic restrictions. A rehabilitation consultant explained the tele-rehabilitation model of care to individuals and their family members and obtained informed consent expressing their interest in participation. Professionals such as low vision consultants (n = 2), rehabilitation consultants (n = 4), speech therapist (n = 2), physiotherapist (n = 2), specialty educator (n = 2), helpline counselor (n = 2), computer instructor (n = 4), and Digital library coordinator (n = 1) were involved in in-service care. A central coordinator was liaising between the service providers (professionals) and the receivers (clients and their family members). The coordinator also monitored the overall administrative process including team training, data management, and reports review [Table 1].

The software ‘Team-Viewer,’ was used to access Electronic Medical Records (EMR) of the patients enrolled for tele-rehabilitation. The EMR enabled the team to view the records, check the logs, document the intervention, and generate weekly and monthly reports. The training was facilitated through mobile what’s app calls. The decision for connecting a video call was upon mutual agreement between the clients and therapists. The professionals obtained informed consent to confirm individuals’/caregivers’ willingness to avail the services through tele-rehabilitation and document the information in EMR. Except for individuals >16 years, the involvement of parents/caregivers in training was compulsory, wherein the professionals guided them to train their children. Additionally, supporting tools such as hand-drawn diagrams, short videos demonstrating the therapeutic activities, and written instructions were also provided to facilitate their learning. The length of each training session varied between 45 minutes and 1 hours, and the overall training sessions also diverged from a single session to over a hundred sessions between individuals on factors such as the training need, individual’s capacity to learn, parent’s ability to follow the instructions of the therapists and transfer the skills on the child, net connectivity, and so forth. This study adhered to the tenets of the Declaration of Helsinki.

Results
Three hundred and five individuals with vision impairment received tele-rehabilitation, of which 42% (n = 129) were children with vision loss and developmental disabilities. The mean age of the participants was 12 years with age range from 3 to 35 years, and 205 (67%) were males. Majority of the participants had severe visual impairment (14%) and blindness (51%). Retinal disorders were the leading cause of visual impairment in 147 (48.17%) patients [Table 2].

The type of intervention provided was based on individual unique needs. Among individuals who received services, 58% were having single disability as vision impairment and the remaining were with developmental delays besides vision loss. The highest accessed area of services were early intervention to children with vision loss and developmental delays and computer training through Assistive software. The least accessed services were mobility guidance and mathematical skills training (n = 1) on Taylor frame and Abacus (n = 2).

Discussion
Discussion Vision rehabilitation is an integral component of universal health coverage. It is considered a critical strategy for achieving Sustainable Development Goal 3 – “Ensure healthy lives and promote well-being for all ages.”[17] Rehabilitation aims to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment through a set of interventions.[17] However, the prevailing pandemic has disturbed the delivery of rehabilitation services in 60–70% of countries,[17] keeping individuals and their families at risk for disability related issues. Therefore, the primary purpose of tele-rehabilitation was to provide support to maintain their physical and mental well-being in the prevailing challenging situation. This study provides evidence to tele-rehabilitation as an effective alternative service delivery model to individuals with vision impairment.

The wide range of services offered, beginning with individual and family counseling for psychological well-being to skills training on daily living, therapeutic intervention, and educational aspects, helped them maintain their functioning.

![Figure 1: Tele-rehabilitation: recruitment and intervention](image-url)
usually, the compliance to make follow-up visits to the centre is very poor because of reasons such as physical strain and inconvenience in carrying the child, especially with multiple disabilities; the cost and time spent factors on travel are some of the common challenges in attending intervention at the center. The finding of parental compliance to continue intervention through tele-rehabilitation in this study is an important observation. The benefits of receiving services at the home environment can be continued as a choice of model or added as a blended model of care receiving initial assessment and periodical follow-up at the center combined with regular home-based intervention with its many advantages.

Tele-rehabilitation guidelines exist for other fields of restoration, such as physiotherapy[10], however, there are no such guidelines available for vision rehabilitation. In this study, tele-rehabilitation was initiated on situational demand with no previous knowledge and background in this area. This study followed the general guidelines recommended for physiotherapy as a baseline to initiate services and has developed its model based on its challenges and experiences in delivering services through a virtual platform. The expertise on know-hows provided an opportunity to establish a model of care to the doorstep of individuals needing it. The training progress was monitored and evaluated regularly by both the therapists and parents. A detailed record of individual’s particulars including the type of training, duration, and individual’s learning response and outcome, information on a caregiver who attended the session, follow-up schedule, and so on, was maintained in Electronic Medical Records regularly. At an individual level, parents were asked to keep the critical progress achieved.

While it was easier to evaluate the learning outcomes of most of the skills training such as braille, abacus, computer, mobility, and so forth, assessing the same for early intervention services for children with multiple disabilities was limited to the beliefs of parents ranging from some progress to a lot of improvement. The pre vs. post-intervention progress gained on functional areas could not be applied through tele-rehabilitation. This suggests development of a tele-rehabilitation protocol for guiding services that can be managed effectively with tele-rehabilitation and those that require additional intervention above and beyond tele-rehabilitation.

The major challenges encountered in the initial phase were poor internet connectivity, orienting parent to handle technology, and scheduling appointments based on individual preference. Another important challenge faced was motivating the parents enroll for tele-rehabilitation, as many of them had
their apprehension in service efficacy; virtual vs. in-person training.

With the increase in the aging population and the increased survival rate of children with developmental birth risks, the demand for low-vision rehabilitation services is growing on the other; the current utilization of services is limited to less than 10% due to barriers relating to lack of trained resources and services in many countries. The WHO estimates the unmet needs for rehabilitation in low- and middle-income countries to be more than people who require the services. Tele-rehabilitation will be a viable solution to meet the unmet needs of people with limited resources. By educating and training community volunteers and family members, primary rehabilitation care can be initiated to them under the supervision of rehabilitation professionals.

Developing a robust mechanism for vision rehabilitation services through a virtual platform is needed for the current situation and future-readiness for such adverse conditions. Experiences from the present study is positive indicative of scaling up the services to the remotest community by developing a protocol for delivering standardized tele-rehabilitation services.

**Conclusion**

The on-going pandemic is expected to continue to bring unprecedented challenges, which may prevent or delay the rehabilitation process. Therefore, developing a strong national policy for the inclusion of tele-rehabilitation with standards for vision rehabilitation care is at most important to reduce the disability burden for the patients, their families, and community. The increasing use of technology, the amplified expansion of data connectivity, and the growing interest of people to incorporate technology should be utilized to raise the scope of tele-rehabilitation to the next level.

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**Conflicts of interest**

There are no conflicts of interest.

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