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Original Article

Client Perspectives of Telerehabilitation in Stuttering during the Covid-19 Pandemic: A Survey at a Tertiary Rehabilitation Center in Kerala

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ABSTRACT

Background: Studies on telerehabilitation in India have primarily addressed the clinicians' perspective. Therefore, this study aimed to understand the perspectives of clients—specifically adults who stutter—regarding telerehabilitation during the COVID-19 pandemic.

Methods: A mixed-methods survey, combining interviews and self-report questionnaires, explored client perspectives on telerehabilitation for adults who stutter during the pandemic. Twelve adults who stutter aged 18 to 40 attending telerehabilitation sessions at a tertiary rehabilitation center participated in the study.

Results: All participants expressed comfort in discussing their problems and anxieties with the clinician during teletherapy sessions. Additionally, 91.7% (n=11) reported feeling confident in managing the online platform. Of the participants, 66.7% (n=8) rated the sessions as excellent, while 33.3% (n=4) rated them as good. Preferences regarding session modes were evenly split, with 50% favoring teletherapy and the other 50% preferring a hybrid approach. The majority of participants considered avoiding travel during the pandemic to be a significant advantage of telerehabilitation. However, internet connectivity issues were identified as a major disadvantage.

Conclusion: The findings of this study highlight both the advantages and challenges of telerehabilitation for adults who stutter. Participants reported that telerehabilitation helped improve their speech fluency and proved a viable and effective approach for addressing stuttering during the COVID-19 pandemic.

Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic has significantly influenced all aspects of healthcare delivery. To prevent the spread of COVID-19, social distancing measures have been implemented globally. Consequently, rehabilitation services in various settings have been profoundly impacted, prompting speech-language pathologists to adopt telemodalities in innovative ways to serve their client populations.

Telepractice in speech-language pathology refers to using telecommunications technology to deliver professional services, including assessment, intervention, and consultation, over a distance by connecting clinicians to clients or other clinicians [1]. The shift to telerehabilitation has created new opportunities for learning and service delivery. Despite its rapid implementation, the overall experience with telerehabilitation has been positive [2].

Telerehabilitation in speech-language pathology is a

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relatively new development in India, with just over a decade of history. The All India Institute of Speech and Hearing, Mysore, established a specialized center for rehabilitation and education via distance mode in 2009, marking what could be considered the official inception of tele-services in speech-language pathology and audiology [3].

Before the COVID-19 pandemic, only a few speech-language pathologists in India provided telerehabilitation services, as evidenced by the small number of participants in studies reported from India [3, 4]. Notably, all reported studies on telerehabilitation from India [3-6] have focused on the clinician's perspective. However, it is equally important to understand clients' perspectives regarding telerehabilitation.

Stuttering is a disorder of fluency characterized by frequent repetition or prolongation of sounds, syllables, or words, as well as frequent hesitations or pauses that disrupt the rhythmic flow of speech [7]. Numerous studies have identified telerehabilitation as a promising and feasible service delivery approach for adults who stutter, enabling them to improve and maintain their fluency [8-11].

In a recent study on telerehabilitation during COVID-19 conducted in Kerala, 77 out of 104 participating Speech-Language Pathologists (SLPs) provided telerehabilitation services, with 39% of these SLPs serving adults who stutter [6]. Bayati and Ayatollahi [12] reviewed 15 articles and categorized the factors affecting telerehabilitation into four main areas: individual, technical, clinical, and economic. Individual factors included providing access to healthcare services, respecting personal privacy, and offering flexibility in scheduling appointments. Technical factors primarily addressed issues such as Internet speed and other technological challenges. Clinical factors were categorized into positive and negative outcomes, while economic factors focused on time and cost savings.

Kully [13] reported that video conferencing software delivered an integrated treatment approach over three weeks. Patient satisfaction was documented, and the findings were positive. McGill, Noureal and Siegel [10], in a systematic review, noted that university-based researchers and educators utilized telerehabilitation to implement various treatment programs, including the Camperdown Program, the Lidcombe Program, and an integrated treatment approach for adults who stutter. Barnett [8] presented a case study demonstrating how telerehabilitation can serve as a speech-language pathology service delivery model for a school-aged child who stutters. The findings indicated that telerehabilitation helped the child enhance their use of stuttering modification strategies to manage stuttering. Additionally, the study reported increased self-acceptance of stuttering due to telerehabilitation treatment. While telesessions were effective, adults who stutter preferred in-person therapy over telerehabilitation [14].

There have been few studies comparing telerehabilitation with traditional in-person evaluation or intervention. Cangi and Togram [15] compared the outcomes of telerehabilitation and in-person therapy for traditional stuttering treatment. Half the participants received treatment via telerehabilitation, while the other half received in-clinic services. The results indicated no significant difference between the two methods, suggesting that telepractice is equally effective as in-person therapy for adults who stutter. McGill, Siegel, and Noureal [16] compared in-person and telerehabilitation evaluations of stuttering in adult participants. The findings suggested that online stuttering assessments are comparable to in-person evaluations in duration, clinical outcomes, and client experiences. Additionally, McGill, Cullen, and Webb [17] explored the experiences and perspectives of clients receiving telerehabilitation for stuttering through a survey. The quantitative results showed a slight preference for in-person treatment but also revealed a strong belief that personal treatment goals can be achieved through telerehabilitation, alongside a positive perception of building friendly and supportive relationships with clinicians via this modality.

Although telerehabilitation is widely used in other countries, its acceptance in India has only gained momentum in recent years. Transitioning from an in-person service delivery model to a telerehabilitation mode can influence clients' attitudes, raising concerns for many, even though it has become necessary in the current scenario. These concerns can positively or negatively impact therapy sessions and clients' prognoses. Understanding clients' perspectives on telerehabilitation is crucial for implementing necessary changes in this evolving field and enhancing the quality of telerehabilitation services. Most reported studies conducted in India explore telerehabilitation from the perspective of speech-language pathologists, but there is a notable lack of literature examining client perspectives on telerehabilitation for stuttering. Therefore, the present study aims to understand client perspectives on telerehabilitation in adults who stutter during the COVID-19 pandemic. The objectives are to evaluate clients' comfort with using technology for telerehabilitation, identify the benefits, drawbacks, and challenges they encounter, and present suggestions from clients to improve the delivery of telerehabilitation.

Methods

Study Design

A mixed survey method, comprising an interview and a self-report questionnaire, was employed to explore client perspectives on telerehabilitation in adults who stutter during the COVID-19 pandemic. Twelve adults aged 20 to 40 who stutter attended telerehabilitation at the National Institute of Speech and Hearing (NISH), Trivandrum, Kerala, India, participated in the study. The diagnosis was conducted by a licensed Speech-Language Pathologist with expertise in fluency disorders using the *Stuttering Severity Instrument-4 (SSI-4)* [18]. The inter-rater reliability, intra-rater reliability, criterion prediction validity, and construct identification validity of the SSI-4 were established in 2004 [18].

Participants included individuals with stuttering severity ranging from very mild to severe who had attended telerehabilitation for at least three months. All

participants had a minimum educational qualification of graduation. Additionally, participants had no speech, language, or neurological deficits other than stuttering.

Procedure

The study was approved by the Institutional Review Authority for Research (RAR ID: NISH 187518). Data was collected between August and September 2021 using a mixed survey method, including an interview and a self-report questionnaire.

A self-report questionnaire comprising 19 questions was designed to gather responses from adults who stutter attending telerehabilitation at NISH. Additionally, seven interview questions were prepared for the participants. The questionnaire and interview questions were developed based on specific themes and underwent content validation.

All participants provided informed consent. The self-report questionnaire was distributed via Google Forms, and the interviews were conducted individually through Google Meet. A social worker conducted the interviews to minimize potential bias toward clinicians. The interviews were recorded with the participant's consent.

Participants were informed about the study's purpose and assured of the confidentiality of their responses. The collected responses were compiled, and appropriate analyses were conducted.

Data Analysis

Descriptive statistics were used to analyze the results of the self-report questionnaire. For the interview data, thematic analysis [19] was employed. The data were coded into priori themes derived from the literature [17] and grouped into the following categories: treatment delivery preferences, advantages and disadvantages of telerehabilitation, and suggestions for improvements to telerehabilitation. No additional themes were generated, as the responses from clients adhered to the priori themes.

To ensure the precision of coding, a sample of the data was cross-checked, and the first author carried out consensus coding. The results of this study aim to understand clients' comfort with using technology for telerehabilitation, their interpersonal interaction with clinicians, speech-related concerns, ratings, and recommendations. Additionally, the study seeks to identify the benefits, drawbacks, and challenges of telerehabilitation from the clients' perspectives and obtain suggestions for improving the delivery of telerehabilitation.

Results

The results of this study are documented in two sections:

A. Results of the Self-Report Questionnaire

The questionnaire was developed based on the following themes: comfort with technology, interpersonal interaction with the clinician, addressing speech-related concerns, and ratings and recommendations. All participants were 20–40 years old, with the mean age presented in Table 1. There were 11 males and one female in the sample, and all participants had an education level of graduation or higher (Table 1).

Among the participants, 58.3% (n=7) had never attended in-person speech therapy sessions, while 41.7% (n=5) had attended in-person sessions before the COVID-19 outbreak. The number of in-person sessions attended by participants ranged from 1 month to 2 years (Figure 1). Additionally, 66.7% (n=8) of participants had not heard of telerehabilitation before the COVID-19 outbreak, while 33.3% (n=4) were already aware of the tele-mode of rehabilitation.

Comfort with Technology

All participants received synchronous telerehabilitation through Google Meet. Of these, 83.3% (n=10) reported handling the technological aspects well before starting telerehabilitation, while 16.7% (n=2) could manage the technology only to some extent. However, once the tele-therapy sessions began, 91.7% (n=11) of the participants reported handling the online platform well, while 8.3% (n=1) could manage only to some extent.

Interpersonal Interaction with Clinician

According to the survey, 91.7% (n=11) of the adults who stutter could fully comprehend the therapist's explanations during the tele-therapy sessions, while 8.3% (n=1) could understand them only to some extent. Furthermore, 75% (n=9) of the participants could carry out the clinician's instructions at home well, while 25% (n=3) could follow the instructions only to some extent. All participants reported that the clinician provided enough time to address their doubts or concerns during the tele-therapy sessions, and all were comfortable discussing their problems and anxieties with the clinician during these sessions.

Speech-Related Concerns

When asked whether anxiety caused during tele-therapy sessions led to an increase in stuttering, 75% (n=9) of the participants reported that their stuttering did not increase, 8.3% (n=1) reported that their stuttering did increase, and 16.7% (n=2) were unsure whether the frequency of stuttering moments had increased or decreased. However, all participants reported experiencing an improvement in speech fluency after attending the tele-therapy sessions.

Rating and Recommending

Participants were asked to rate their experience with the teletherapy sessions. Of them, 66.7% (n=8) rated the sessions as excellent, while 33.3% (n=4) rated them as good.

Table 1: Mean age, Gender, and education details of the participants.

Age	Gender		Education
	Male	Female	
Mean Age (SD)=27.5 (5.73)	91.7% (n=11)	8.3% (n=1)	50% (n=6) - graduates 41.7% (n=5) - postgraduates 8.3% (n=1) - PhD

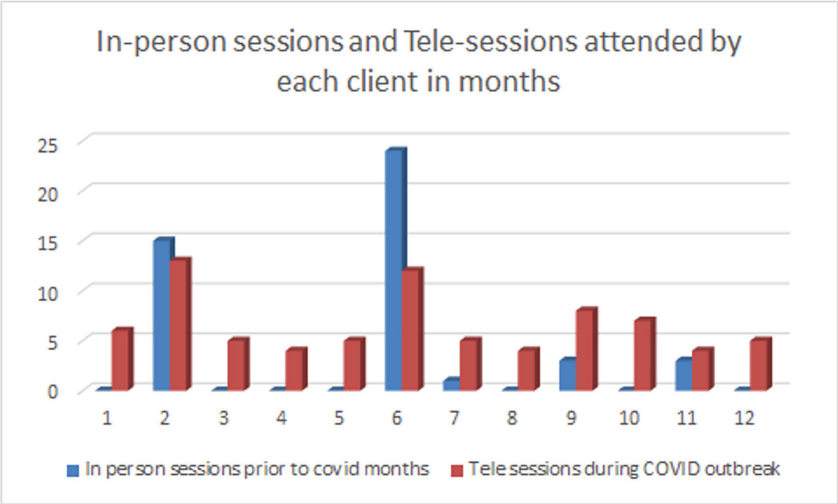

Figure 1: In-person sessions and tele-sessions attended by each client (in months)

Table 2: List of open-ended interview questions

SL No	Open ended Interview questions
1	In your opinion, what are the advantages of teletherapy sessions?
2	Given the option of attending in-person or teletherapy sessions post-COVID-19 outbreak, which type of sessions do you prefer?
3	Reason for selecting that specific answer in Question No. 2.
4	Have you experienced any barriers to using the technology for teletherapy?
5	If yes, mention the barriers.
6	What are the other challenges you faced while attending teletherapy sessions?
7	Any suggestions to improve the quality of teletherapy?

Table 3: Reasons reported by participants for preferring hybrid mode of sessions

Sl No	Reasons for preferring hybrid mode of sessions	The percentage of participants who responded
1	Hybrid sessions will be more effective	16.67 (n=1)
2	Do not prefer complete virtual exposure	16.67 (n=1)
3	Better interpersonal interaction during in-person sessions	33.33 (n=2)
4	Since it's one session per week, there is no inconvenience in attending in-person sessions once in a while.	16.67 (n=1)
5	Information received from a friend that in-person sessions are more effective and interesting	16.67 (n=1)

All participants indicated that they would recommend teletherapy sessions for individuals requiring therapy for stuttering.

B. Results of the Interview

Seven open-ended questions were included in the interview method (Table 2). The recordings of the interviews were analyzed and coded based on specific themes [17]. These themes included treatment delivery preferences, advantages and disadvantages of telerehabilitation, comfort with technology, and suggestions for improving telerehabilitation.

1) Treatment Delivery Preference

Fifty percent of the participants preferred telerehabilitation, while the other 50% preferred a hybrid mode (combination of in-person and tele-sessions). Participants who preferred tele-sessions cited the impracticality of long distances to attend sessions at the institute as the primary reason for their choice. All participants reported satisfaction with the tele-session services provided.

Participants who opted for the hybrid mode had varied reasons for occasionally preferring in-person services (Table 3). Among those who chose the hybrid mode, 50% (n=3) had prior experience with in-person therapy, while the remaining 50% were new to in-person treatment.

2) Advantages and Challenges of Telerehabilitation

The participants reported several advantages of telerehabilitation. The most common benefits included avoiding travel during the pandemic, the flexibility of attending sessions from any location, significant time savings, and eliminating travel expenses. These advantages are summarized in Table 4.

Most participants (75%) encountered barriers while using technology for telerehabilitation. The most commonly reported issue was internet connectivity problems, particularly during unfavorable weather conditions. Additionally, four out of twelve participants (33.3%) reported experiencing non-technical challenges. These included difficulties attending therapy sessions due to competing responsibilities (16.7%) and conflicts between session timings and their official work schedules.

3) Suggestions for improving Telerehabilitation Sessions

Four participants offered suggestions to enhance telerehabilitation sessions, as summarized in Table 5.

Table 4: Advantages of telerehabilitation reported by the clients

SL No	Advantages of Telerehabilitation	The percentage of participants who responded
1	Can avoid traveling during Covid- 19 pandemic	83.3%(n=10)
2	Can attend sessions from anywhere	75% (n=9)
3	Can attend speech therapy sessions without affecting the official work	58.3% (n=7)
4	Time-saving	75% (n=9)
5	No expenses on travel	75% (n=9)
6	Therapy is more accessible during Covid-19	25% (n=3)
7	More convenient	8.3% (n=1)
8	Better improvement through telerehabilitation	8.3% (n=1)
9	Very flexible	8.3% (n=1)

Table 5: Suggestions for improving telerehabilitation sessions

SL No	Suggestions given to improve the telerehabilitation sessions
1	Since tele-sessions are easy to record, they can be recorded and given to clients for feedback.
2	Increase the duration of session to one hour.
3	Good network connection and power backup for the clinician
4	Flexibility on session timing required

The remaining eight participants (66.7%) expressed satisfaction with the current implementation of telerehabilitation and did not provide additional suggestions.

Discussion

This study aimed to explore clients' perspectives regarding telerehabilitation for adults who stutter during the COVID-19 pandemic. One of the primary strengths of delivering telerehabilitation services at the institute was the presence of a well-developed in-house IT infrastructure [20]. Furthermore, when the Covid-19 pandemic shutdown was declared, a previously established tele-rehabilitation unit allowed services to be easily shifted to an online form [20]. In addition, the speech-language pathologists providing telerehabilitation services already experienced technology-enhanced classroom learning, which they utilized for higher education teaching activities. While the experts could transition quickly to an online mode, the abrupt change in the delivery method posed several challenges. These challenges required significant effort from professionals, who worked diligently to address them by gathering information. By employing trial-and-error procedures, the professionals gained valuable insights into the nuances of telerehabilitation [6].

Tele-speech therapy has been reported as an effective treatment modality for individuals who stutter, regardless of their age, gender, or educational background [9]. The literature consistently highlights a higher prevalence of stuttering among males than females [21, 22]. This trend was reflected in the present study, where most participants were male, with only one female participant.

Telerehabilitation gained significant popularity among the general public following the outbreak of the COVID-19 pandemic. As expected, most participants in this study had not heard about telerehabilitation before the pandemic. Despite this, all participants could handle the technological aspects of telerehabilitation either well or to some extent before attending tele-therapy sessions. Additionally, they effectively managed the online platform used for tele-therapy. Factors such as the robust digital infrastructure in India [23] and the high literacy rate in Kerala [24] likely contributed to this adaptability.

Sharma et al. [25] identified technological issues as a primary concern for older participants in teleservices. However, in the current study, all participants were aged 18–40 and were either students or working professionals familiar with technology. Clients' comfort with using technology may improve with increased exposure and familiarity [26].

The speaking situation plays a significant role in the performance of adults who stutter. Wilkie and Beilby [27] observed a notable difference between phone conversations and face-to-face interactions, with phone-based communication often resulting in increased disfluencies. In the current study, one participant reported an increase in stuttering during teletherapy sessions, likely due to the general anxiety associated with situational variability in stuttering [28].

Despite this, all participants in the survey indicated that they could understand and follow the instructions provided by their clinicians during tele-therapy. Additionally, participants reported that clinicians allocated ample time to address their doubts and concerns, and they felt comfortable sharing their anxieties with the clinicians. These findings suggest that clients were able to establish a meaningful rapport with clinicians during tele-therapy sessions. This result aligns with prior research, highlighting the ability of telepractice to foster rapport between clients and clinicians [17, 29].

Furthermore, all participants reported improvements in speech fluency as a result of attending teletherapy sessions and rated their overall experience as either excellent or good. McGill, Cullen, and Webb [17] similarly noted in their study that clients felt their treatment goals were adequately addressed through telerehabilitation. Previous studies also identified telerehabilitation as a promising and viable service delivery model for stuttering adults seeking to improve and maintain their fluency [8-11].

The interview results were coded based on themes identified in prior research, including treatment delivery preference, advantages and disadvantages of

telerehabilitation, and improvements to telerehabilitation treatment [17]. Half of the participants preferred hybrid mode of treatment delivery, while the other half favored the synchronous mode of telerehabilitation. Regardless of their preferences, all participants provided positive feedback on the quality of services delivered through telerehabilitation. These findings suggest that clients may have a modest preference for in-person therapy, but they recognize that telerehabilitation for stuttering effectively improves speech fluency.

Previous studies by Kruse et al. [30] and McGill, Cullen & Webb [17] also reported that clients receiving telerehabilitation tended to prefer in-person treatment while simultaneously highlighting numerous benefits of telepractice, such as reduced costs and decreased travel time. However, in the present study, participants clearly preferred hybrid model—a combination of tele-therapy and in-person sessions. Participants noted that hybrid therapy allowed them to meet clinicians periodically, fostering stronger interpersonal relationships, while synchronous tele-sessions reduced travel-related risks during the pandemic. This finding is consistent with Cottrell et al. [2], who reported that clients receiving allied health services preferred a blended telehealth and in-person care model.

Interestingly, prior experience with in-person therapy did not appear to be a decisive factor in treatment delivery preferences. Among participants who preferred the hybrid model, only 50% had prior experience with in-person therapy, while the other half were new to such sessions. Furthermore, not all participants with in-person therapy experience opted for the hybrid mode. A larger sample size in future studies would provide a more comprehensive understanding of clients' perspectives on treatment delivery preferences.

The primary advantage cited by participants in the present study was related to travel. Participants reported that they could attend sessions from any location, significantly reducing the risk of traveling during the COVID-19 pandemic. Furthermore, most participants, who were employed across various fields, noted that telerehabilitation allowed them to continue therapy without interfering with their professional duties. These advantages align with findings from previous studies [15, 17, 30].

A significant barrier identified by all participants was internet connectivity issues. In Kerala, the state experiences high annual rainfall, averaging 120–140 rainy days per year [31]. Frequent climatic variations may lead to interruptions in internet connectivity, making it a persistent challenge for telerehabilitation. Additionally, a small percentage of participants reported non-technical challenges, such as difficulties attending therapy due to other personal responsibilities or scheduling conflicts with their work. Since this study was conducted in an institutional setting, therapy sessions were restricted to specific working hours, limiting flexibility in scheduling.

Interestingly, unlike previous studies [17, 30], which identified limited interpersonal connections as a disadvantage of telepractice, none of the participants in the current study reported issues with clinician-client communication. All participants expressed satisfaction with their interpersonal interactions with their clinicians during telerehabilitation.

Only four participants provided suggestions to improve telerehabilitation, while the remaining participants were satisfied with the current setup and had no suggestions. The suggestions included recording and sharing sessions with clients, increasing the session duration to one hour, ensuring a reliable network connection and power backup for clinicians, and offering more flexibility in session timing. These suggestions will be shared with the institute's responsible authorities and considered to enhance the quality of telerehabilitation services for adults who stutter.

The sample size in the current study was relatively small (N=12). A larger sample size would provide a more comprehensive understanding of clients' preferences regarding treatment delivery. Additionally, the study's sample was drawn from a single institute, where the infrastructure may differ from other setups, limiting the generalizability of the findings to all clinical environments. Furthermore, this study exclusively focused on adults who stutter, excluding children. Future research could explore similar studies among children who stutter and their parents to gain insights into their perspectives on telerehabilitation.

Conclusion

The results of this study highlighted the advantages of telerehabilitation while also identifying the challenges faced by individuals with stuttering during their treatment. Participants reported that telerehabilitation was a feasible and effective option, as it helped them improve their fluency. Notably, all participants stated they would recommend telerehabilitation sessions to others needing stuttering therapy.

Telerehabilitation services proved to be a critical solution during the unforeseen lockdowns following the COVID-19 outbreak. They enabled professionals to provide uninterrupted therapy for individuals with disabilities. The growing interest in and familiarity with technology among service users facilitated the swift implementation of telerehabilitation practices.

Telerehabilitation can become as effective as in-person therapy by addressing concerns such as internet connectivity and session timing flexibility. It offers a practical and viable alternative for adults who stutter, particularly those unable to access traditional in-person therapy services.

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