

Piloting teletherapy for children with hearing loss in Malaysia

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Abstract

Teletherapy is defined as utilising telecommunications technology for professionals to deliver their therapy sessions to the client from a distance. Hear Me, a national parent support group for children with hearing loss, initiated a small-scale teletherapy programme. This pilot teletherapy programme addresses the availability of, and accessibility to, quality therapy services provided by trained professionals. Teletherapy was provided to four families with a child with significant sensorineural hearing loss prelingually. All children use spoken language as their mode of communication. Each child received two speech-language therapy sessions and one literacy intervention session, per month, for six months. Each session consisted of (i) direct instructions to the child, and (ii) parent coaching to enable them to become skilled facilitators to their child. Two professionals were involved - one is a speech-language pathologist specialised in spoken language intervention for children with hearing loss, and the other is a teacher-of-the-deaf who is also trained in literacy development. Both professionals have graduate level education and training in the area of paediatric hearing loss. The platform used for teletherapy was Zoom®, chosen for its secured feature that protects sensitive and confidential information. The families accessed the virtual therapy room either via a specific web address on their browser, or by installing Zoom® application on their device. An exit survey shows that in general, both parents and professionals reported positive outcomes for teletherapy not only for the children, but also for the parents in supporting their child in the home environment. The ease and practicalities of teletherapy as a mode of service delivery, along with its contributions and limitations will be discussed. The findings from this pilot teletherapy programme suggest its potential to be delivered in a wider scale to other children in need of quality therapy services.

Keywords: *teletherapy, hearing loss, speech-language therapy, reading specialist*

INTRODUCTION

Delivering services through videoconferencing technology is gaining traction all over the world. Due to the growing ubiquity of the internet and devices that would support mobile communication, this service delivery method is becoming more attractive to both the service providers and clients (Regina Molini-Avejonas et al., 2015). Depending on the field and purpose it serves, this service delivery method has been known as teletherapy, telepractice, teleintervention, telehealth, and telemedicine (Lancaster et al., cited in Chen and Liu 2017). In Malaysia, service delivery through the application of this technology has been adopted in the field of medicine for the past 20 years (Abushaar and Ismail, 2018). However, there has been a dearth of studies or reports pertaining to the utilisation of videoconferencing in the education field, particularly for children with hearing loss.

The services that a deaf and hard of hearing (DHH) child requires may include audiology, speech-language therapy, occupational therapy, physical therapy, reading intervention, and access to a sign language specialist. This list is non-exhaustive, depending on the child's needs and the family's goals with regard to the child's overall development. However, due to factors such as location, availability of high-quality professionals, logistics, and cost, a DHH child might not be able to access these services (Perkins Walker, 2015; Barr et al., 2018). Hence, teletherapy or telepractice is increasingly regarded as a feasible solution to ensure accessibility to the services (Cohn and Cason, 2012; Douglas, 2012; Swanepoel and Hall, cited in Houston et al. 2012).

Teletherapy

For the purpose of this paper, the term ‘teletherapy’ will be used to denote therapy delivered online. According to the American Speech-Language Association (ASHA), teletherapy can be defined as the “application of telecommunications technology to deliver professional services at a distance by linking clinician to client or clinician to clinician for assessment, intervention, and/or consultation” (ASHA, 2013). Teletherapy has been practised in countries such as the United States and Australia to address the gap between the availability of services and service providers, and the service recipients (Behl et al., 2012; Blaiser et al., 2012; Stredler-Brown, 2012; Barr et al., 2018).

Teletherapy is time and cost-effective in that it eliminates travelling expenses and reduces travelling time as the families only need to stay at home and the professionals can conduct their sessions from their home or office (Douglas, 2012). This ensures that the children and their families receive consistent therapy, as a result of fewer session cancellations that often happens with the more traditional in-person therapy (Houston and Stredler-Brown, 2012; Chen and Liu, 2017). Additionally, when compared to in-person therapy, teletherapy does not differ in producing positive outcomes (WHO and World Bank cited in Cohn and Cason 2012; Chen and Liu; Freckmann et al., 2017; Coufal et al., 2018).

Further, teletherapy can be conducted at the client’s home, centres and schools with favourable outcomes, not only for the DHH children but also their families (Miller, 2014; Regina Molini-Avejonas et al., 2015; Fairweather et al., 2016). Teletherapy has been found to increase parents’ knowledge and confidence in supporting their children in developing language and communication skills (Davis et al., 2012; Houston and Stredler-Brown, 2012), via the professional’s modelling strategies and parent coaching. This is to ensure that the therapeutic strategies are integrated into the child’s daily routine (Behl et al., 2012; Blaiser et al., 2012).

PROBLEM STATEMENT

Despite the benefits mentioned above, there are however, challenges to the implementation of teletherapy. A critical component in ensuring the success of a therapy conducted online is the strength and reliability of the internet connection. With compromised connectivity, audio and visual transmission could be lagging or disrupted, causing interruption in the delivery of services. Studies on speech and language teletherapy reported that participants faced technical difficulties and there were instances when sessions could not be carried out when the internet connection was down (Constantinescu, 2012; Fairweather et al., 2016). Further, a systematic review conducted by Regina Molini-Avejonas et al. (2015) cited internet speed as one of the barriers to the implementation of teletherapy.

Another challenge associated with the online service delivery method is building rapport with the participants. With teletherapy, face-to-face interaction may be limited to occasional visits by the therapists (Blaiser et al., 2012), which may occur at the beginning of the programme, or special outreach programmes (Davis et al., 2012). In some other cases, teletherapy was conducted entirely online with no supplemental face-to-face interaction. This could pose as a challenge for children to develop rapport with the therapists that they are working with, as some parents believe that their child would be better able to ‘connect’ with their therapists through face-to-face interaction (Fairweather et al., 2016).

To address the availability of, and accessibility to, quality therapy services, Hear Me, a non-governmental organisation of parents with DHH children (Hear Me Malaysia, 2019) initiated a teletherapy project for those who are in mainstream education. The purpose is to provide a consistent quality therapy by highly-qualified professionals who are certified to work with the DHH population. The fact that services would be available regardless of inclement weather, logistics difficulty, and incapacitating distances makes teletherapy a viable option for DHH children and their family to receive quality therapy that would otherwise be unavailable due to their age and location.

In Malaysia, the Universal Newborn Hearing Screening (UNHS) is increasingly being introduced in major hospitals nationwide (Ministry of Health Malaysia, 2014). This translates into an increase of early-diagnosed and -intervened children. When fitted early and optimally with devices

such as hearing aids (HA), bone-anchored hearing aids (BAHA), or cochlear implant (CI), these children have better prognosis of acquiring spoken language and consequently being enrolled in mainstream education programmes.

Unfortunately in Malaysia, many DHH children receive regular speech-language therapy from government hospitals only up to three years after initial amplification or cochlear implantation. This is due to the long waiting list for therapy and the critical shortage of professionals (BERNAMA, 2016). In some cases, the children do receive therapy, but the frequency and intensity are too low. For example, a DHH child might only get a one-hour speech-language therapy session in three months and when s/he returns for the next session, the professional would have to start establishing rapport and reinforcing target skills all over again. Consequently, this difficulty to benefit from the necessary amount of therapy could compromise the child's potential in achieving significant gains in language and communication abilities.

In addition, in states such as Sabah and Sarawak, therapy centres and available professionals are extremely limited, especially considering the geographical size of these states and the inhibiting distances between the DHH children and the location of service. Further, it is pertinent that a DHH child receives therapy from highly skilled professionals as they are trained to address the specific needs of these children (Muse et al., 2013). Unfortunately, quality professionals specialising in hearing loss and deaf (oral) education are hardly available. As a result, many of these children struggle in the mainstream education settings. The absence of consistent therapy and the lack of educational support and accommodations negatively impact their academic performance. This situation is not only unique to Malaysia. It has been observed in other studies conducted by Goldberg and Richburg (2004); Foster and Cue (2008); and Reed and colleagues (2008) in which, administrators and general education or mainstream teachers were not aware of the unique language issues of the DHH student population.

OBJECTIVE

The aim of this paper is to describe this pilot teletherapy project. This paper will report on the recruitment process, technology and the online platform used, the delivery of teletherapy, as well as the interprofessional consultation practices. The authors will also discuss the findings of this project, to better understand the challenges, requirements, limitations and opportunities, of delivering teletherapy.

METHODOLOGY

This is a qualitative study, employing a retrospective reporting approach that explains, describes, as well as provides a context of the implementation of a teletherapy project in its pilot phase. The authors of this paper applied the data analysis protocol for a qualitative research proposed by Wu et al. (2016) which included the utilization of different sources and types of data such as observation and questionnaires.

Sampling

Hear Me approached 40 potential candidates among DHH school-aged children whose families are members of the organisation. The criteria are:

- DHH children who use hearing devices
- DHH children who attend mainstream education settings (kindergarten, primary, and secondary schools)
- DHH children who have not been receiving therapy for the past six months at teletherapy commencement, and will not be receiving therapy for the next six months after teletherapy conclusion
- Access to reliable internet connection
- Access to laptop, computer, or tablet with webcam

- Commitment for the whole six months
- Can afford the fees
- Priority for families outside Kuala Lumpur due to the scarcity of services

Ten families responded, but only five signed up for the project. The others who did not participate, cited reasons such as conflicting schedule (i.e., time slots offered by professionals did not match with parents' preferred time), and financial constraints. One of the five families that agreed, dropped out after the first session, because their child regarded the tablet used in teletherapy as a gaming device, and was very distracted during the session.

The final four children in the pilot cohort are all CI users and were implanted before the age of 3.5 years old. Their chronological ages range from 6 to 10 years old. Three of them are in primary schools, while one is in a private kindergarten.

Two professionals were recruited to deliver the therapy. One is a speech-language pathologist with a doctorate degree from Australia, who has specialised in working with DHH children for 18 years. She is also the first author of this paper. The other is the second author, a New York State certified Teacher of the Deaf and Reading Specialist. Both professionals underwent a teletherapy course conducted by Teachers College, Columbia University prior to the commencement of the teletherapy project.

Duration

The teletherapy project started in January 2019 with the online teletherapy course for the two professionals. The recruitment process started the next month in February. Teletherapy sessions were carried out for six months from March to August 2019.

Technology

Zoom® was chosen as the platform to conduct teletherapy due to its ability to combine video conferencing, online meetings, chat, and mobile collaboration (Zoom, 2019). Unlike many other remote conferencing softwares, Zoom® is specifically designed for optimum conferencing experience with features such as recording, screen sharing, the flexibility in controlling access to audio or video by the host (mute microphone, stop video), and the ease in working with multiple active windows.

The professionals used noise-cancellation microphone, webcam, and headphones with their laptop. The reliability and effectiveness of each equipment was taken very seriously as the therapy was delivered to children with hearing loss who would require uncompromised access to sound. The families reported using laptop, desktop computer, tablet, and mobile phone during teletherapy sessions.

Inter-Professional Consultation Practices

1) Professional meetings

A pre-project meeting was conducted by the professionals to discuss data gathering method, the assessments to establish baselines, formative assessments, and strategies to maximise learning through an online platform. The professionals also tested out the internet speed and connection, the volume of the microphone, ambient sound, the clarity of the camera, as well as the lighting in the room to ensure the quality of both audio and video input and output.

The two professionals conducted online meetings through Zoom® several times throughout the project to discuss issues concerning participants' performance, behaviour management, and parent communication and support.

2) *Orientation*

An online orientation session was carried out with the participating families to determine the feasibility of delivering the teletherapy service. Aspects that were highlighted included introducing Zoom® as the teletherapy platform; internet connectivity; technicalities such as receiving meeting invitation, troubleshooting, and screen sharing; the format of the session; behaviour expectations; as well as strategies to ensure that overall learning can occur.

3) *Observation*

The second author observed two of the sessions conducted by the first author. These observations were done to address an inconsistency in performance of one of the participants and also as a re-calibrating strategy between the two professionals and the families.

Language

Three of the families use Malay as the main language of communication while one uses English. Sessions were conducted in the language preferred by the family to facilitate transfer of activities and skills from therapy into daily family routines.

Domains

1) *Speech-language and listening*

Speech-language and listening sessions were conducted by the speech-language pathologist. Each child received two speech-language therapy sessions monthly, once in every two weeks. Sessions were scheduled on weeknights, starting at either 8:00 or 8:30 p.m., lasting for one hour. The parents that sit with the child for the session were usually the mothers.

The first session contained assessments to baseline the children's performance in listening, receptive, and expressive language skills. More specifically, the focus was on auditory memory and comprehension, narrative skills, and language-related cognitive concepts. A plan was then drawn out for each child, for each week, via discussion with the mother.

After the initial session, the framework of the subsequent sessions was as follows:

1. Revision of home programme given in the previous session
2. Discussion of today's plan
3. 1-2 auditory skills tasks
4. 1-2 narrative skills tasks
5. 1 cognitive concept task
6. Discussion of today's performance, and home programme for the next two weeks
7. Wrapping up

Tasks were conducted by:

1. The professional or mother giving instructions to the child:
 - Child conducted the tasks using any materials available in the room/at home
 - Child and mother looked at the shared screen from the professional where she had materials displayed from pictures/graphs/ etc.
2. Mother conducting the tasks with the child, with the professional observing and coaching mother

3. Mother and the professional going through a recorded video of the child doing the home program task, and they discussed the strengths and improvements to be made.

2) Literacy

Literacy, which encompasses reading and writing sessions, were conducted by the second author. Each child received one literacy session for one hour per month. During the first session for each child, an intake interview was carried out with their mother regarding the nature of their hearing loss, communication at home and in school, academic performance, as well as the mother's expectations of the programme. Assessments were administered to establish a baseline of the child's reading (e.g. letter naming, fluency, word attack strategies, and comprehension) and writing skills (e.g. letter formation, spelling). From this baseline, both the mothers and the professional came out with goals that their child would achieve by the end of the programme. A plan or 'homework' was also drawn out for each child for the next few weeks until the next session.

After the intake interview, a normal teletherapy session would start with a review of the 'homework' that was given in the previous session followed by the plan for the current session. The professional would demonstrate a strategy to the child, then applied the same strategy with her, before encouraging her to use the strategy on her own. The main purpose for the professional's demonstration of strategies was for the parents to carry them over to their daily routine or activities at home.

Essentially, all the sessions were very similar to in-person sessions, except that the parent played a much more active role with the child. Also, when other siblings were present in the room, they were sometimes included in the tasks as well. There had been instances in which sessions were conducted when the family was away from home due to vacation and holidays. Since they still had access to the internet, the sessions went on as usual. Formative assessments or diagnostic therapy were carried out every session to monitor the child's progress against his or her own goals, target skills, and language development.

Data Collection

There are three types of data: documentation, observational, and exit survey data.

Documentation

Documentation was made by the two authors while engaging in inter-personal consultation practices, which include professional meetings, orientation, and observation, as well as teaching and therapeutic procedures, and therapy session notes. These data are then used retrospectively to provide a rich description of the teletherapy project.

Observational

Zoom® allows recording of each session, and these video-recordings are regarded as observational data that is used for this paper.

Exit Survey

A 10-item exit survey was administered to the parents via Google Form. The items included the parents' perception of their child's ability in areas such as auditory memory, narration, decoding, and reading comprehension in the beginning of therapy and at the conclusion of therapy. The parents also rated their own ability in helping and supporting their child in the areas mentioned above. In addition, the parents reported on their child's level of motivation, engagement, and compliance to the professional's instructions pre- and post-therapy.

RESULT

At the time this paper is written, the 6-month pilot project period has just concluded, within which, 48 speech-language therapy sessions and 24 literacy intervention sessions had been conducted. Out of these, four sessions were conducted when the family was away from home – one was during a family vacation and accessing the internet from their holiday chalet, and three were when the families were out of town but were still able to have internet access for their sessions.

Flexibility

When asked about what they like about teletherapy in the exit survey, some parents remarked about not having to leave work, or for their child not having to skip school for therapy sessions. The flexibility of scheduling offered by teletherapy means that the family's preferred time is more likely to be accommodated – as long as it matches with the professional's availability. Another parent commented on the accessibility to the session from the comfort of their own home. The logistics of travelling to the therapy centre and its accompanying issues (e.g. having own transportation, bad traffic, time spent travelling) are no longer an issue with teletherapy. The obstacles to travelling to/from an in-person therapy are now removed.

Shared Materials

The Zoom® platform provides the facility of sharing materials such as text, pictures, audio or video files, or any window that is opened on the professional's computer screen. For example, materials such as a selected text, or a picture sequence stimulus – are shown on the professional's screen. When the professional hit the 'share screen' button, the parents would be viewing these materials on their screen. The child or the parent, would then be given specific instructions on what to do with the materials. If a text is shared in the literacy session, the child might be asked to decode it. For a speech-language session, the parent might be asked to prompt the child to tell a story based on the picture sequence. During teletherapy, parents learned how to use these materials under the coaching of the professionals.

However, some of the materials needed to be very creatively shared, or improvised when the professional is not present in person with the child. For example, during a literacy session, where a sorting of beginning sounds was conducted, the professional utilised the 'drag and drop method' using a Word document in which the child dragged a picture of a word that begins with the target sound into a column with the target sound labelled on top. The professional explained to the parent that this activity is a mirror of the physical sorting that the child would be required to do with the parent at home.

Reading aloud was also conducted with texts scanned and shared with the parent and child through screen sharing. Interestingly, even though the professional, the parent and the child were looking at the document, they were still be able to see each other through a smaller window on the platform. This enabled the professional to observe the child's engagement toward the text and how the parent interacted with the child using the text as a stimulus.

The e-helper

The role that the parents played during teletherapy is undeniably much more than merely manipulating the stimuli shared by the professionals. The parent's overall main role is as the aide, or the e-helper; who is present with the DHH child during teletherapy, and help their child to focus on the tasks during the session (Akamoglu et al., 2018).

Therefore, the success of the therapy tasks delivery is heavily dependent on the parent. As the e-helper, the parent would receive coaching from the professionals, and then conduct the given task with their child. The professional then provided immediate feedback to the parent, and if necessary, asked the parent to repeat the task until they reach a satisfactory level of competency. Edwards et al.

(2012) describe parent coaching as the professionals “...interacting with... and guiding the parent...” (p.235). Likewise, in this pilot teletherapy project, the professional functions as a ‘tele-coach’ to the parents, where the goal for therapy is for the parent to learn to teach the child. This goal may have been achieved during this pilot project. In the exit survey, all the parents reported an increase in their own ability to support their DHH child in developing spoken language and literacy skills at home during the course of teletherapy. The professionals also reported improvements in all the parents in terms of their ability to support their child at home.

Human factor

Ideally, a therapy session should only be attended by the DHH child, the parent/s, and the professional/s. However, for some families in this project, the presence of other siblings is unavoidable. When this happened, the professional asked the sibling/s to be the model for the target behaviour, or take turns with the DHH child. However, this method might sometimes backfire because the siblings did not provide the intended response as asked by the professional. When this occurred, intrusion from other siblings reduced the actual learning time, and decreased learning behaviours of the DHH child during teletherapy.

Focusing at task may be challenging, especially for children at preschool age who may prefer to “run around and play” (Overby, 2018). When this happened, the professional would initially ask the parent to bring back the child’s attention on the task. If the parent failed, the professional attempted several ways to manage this. Firstly, everyone else at the family’s end would be asked to leave the room, except for the DHH child. The professional would then explain to the child that her or his behavior is not desirable, and attempted to persuade the child to return to the task. Secondly, if the child had reached the point of throwing tantrum, the professional would ask the parent to intervene until the child calmed down, following which the child would return to the task. Thirdly, the professional sometimes ‘put herself on the shelf’, meaning that the professional observed without showing herself on screen to the child, but continued on providing instructions to the parent.

Technological factor

When the internet is disrupted, or connecting on a low bandwidth, the sessions lagged frequently. This sometimes caused very poor quality visual and/or audio that the session had to be postponed. Additionally, the family’s personal computer or laptop sometime had to be sent for service, and they accessed the session via mobile phone resulting in visual accessibility issue due to the small screen size. Using Zoom® on the mobile phone also means that the parent could not take control of shared stimuli at their end, therefore limiting their manipulation of the materials.

The child’s outcomes

From the exit survey, all parents reported improvement in their child’s narrative, auditory memory, reading, and comprehension skills at the conclusion of teletherapy. In addition, the parents also reported improvement in their child’s learning behaviours, i.e., motivation, engagement, and compliance. Similarly, the professionals also perceived improvements in both the children’s skills, and their learning behaviours.

DISCUSSION

Teletherapy closes the distance between service recipients – i.e., the families, and the service providers – i.e., the professionals (Brown and Remine, 2008). From the experience of this pilot teletherapy project, this is not the only flexibility of teletherapy. A session may be conducted regardless if the family is away from home on the therapy day, and likewise when the professional is away from the centre where he/she works. The ‘portability’ of teletherapy is what an in-person session cannot offer.

However, technology is both the enabler and disabler of a remote therapy session. A poor or disrupted internet connection at either the professional's or the family's end means frequent lagging of audio and/or video, or worse, the session closed itself when the internet line dropped off altogether. If troubleshootings, including rebooting the modem and/or device, did not solve the problem, the sessions had to be rescheduled even when they were already in progress. Past studies, such as by Constantinescu (2012) and Regina Molini-Avejonas et al. (2015), also mention poor or unreliable internet connection which consequently affects the quality of teletherapy delivery.

Although Malaysia's fixed broadband speed has reached 61.97 Mbps in October 2018, above the global average of 50.88 Mbps (The Star Online, 2018), some families may not be in the coverage area of this fast speed, or able to afford such internet plans. Affordability of other technological infrastructure for teletherapy is also a concern. The families that live far away from service providers in the cities who face obstacles in travelling to and from therapy, are also the families who are less likely to be able to afford a personal computer or a laptop with webcam, mic, and speaker. This may partly explain the low uptake of teletherapy service offered by the parent support group during participants recruitment. In such cases, a community hall, or a neighbourhood school such as in Brown and Remine (2008) study, that is equipped with teletherapy infrastructure, may be the location for the family to receive teletherapy service.

The parents who were involved as the e-helpers during the therapy sessions have reported improvements in their own skills as their child's facilitator – an indicator of a proactive parent's role. Indeed, teletherapy has been reported as a family-centred service (Brown and Remine, 2008; Stredler-Brown, 2012; Jackson et al., 2015). The fact that the professional is absent physically, allows more time for parent-child interaction. This capitalises on the natural bonding between the parent and the child, as well as utilising the parent's skills. Parent-child interaction facilitated by the professional develops the parent's self efficacy – the more the parent tries to implement the treatment techniques, the more they are likely to be satisfied, which will in turn increase the parent's ability and efficiency to help their child. All these are conceptualised by Moeller et al. (2013) as a family-centred practice. This is in contrast with in-person therapy where some parents may only watch the professionals interacting with their child, without the parents themselves participating. Although in the beginning, some parents may have a more passive expectation of their role and responsibilities in teletherapy, it is the responsibility of the professional to orientate the parent and encourage gradual active participation and facilitate the parent-child interaction.

Managing rapport and behaviour has been a challenge during this pilot teletherapy project. This appears to be an aspect that is frequently discussed in teletherapy (Snodgrass et al., 2017; Akamoglu et al., 2018). Building rapport is acknowledged to be challenging, even for educators who teach teletherapy to speech pathology students in university (Overby, 2018). However, if done successfully, building rapport will promote receptiveness to therapy, and consequently improve progress in targeted skill areas.

Poor rapport building may also lead to uncooperative behaviours during therapy session, as faced by the professionals in this project. In dealing with such behaviours, teletherapy poses an extra challenge due to the professional's inability to physically administer behaviour management strategies, as found in past studies (Blaiser et al., 2012; Overby, 2012; Chen and Liu, 2017). Although the parent is present with the child, Blaiser and colleagues caution that not all parents are successful in managing their child's misbehaviour – a finding that the professionals in this pilot teletherapy concur. When this happens, it reduces the effectiveness of the session. To overcome this, Overby proposes the professionals to employ behaviour reinforcement strategies that are more specific to online sessions, and use resources or activities that actively engage the child's attention.

RECOMMENDATIONS

All parents involved in this pilot project said they would recommend teletherapy to other parents. Similarly, the two professionals involved also support the continuity of this programme. However, several recommendations are made to ensure that teletherapy will be optimally delivered. Firstly, the families must own the technological infrastructure (Snodgrass et al., 2017). For Hear Me teletherapy project, the infrastructure will consist of a reliable internet connection running (at least) at

the minimum speed required by the Zoom® platform, either a personal computer or a laptop, or at least an adequate-sized tablet, and the device must have a good camera, speaker, and mic.

Secondly, as suggested by Akamoglu et al. (2018), a selection criteria of the child has to be developed, because teletherapy may not be suited for every children, or intervention for every skills. For example, if the presence of siblings during therapy is disruptive rather than supportive, the family of DHH child is recommended to arrange for childminding of the siblings. The parent's ability to manage their DHH child's misbehaviour should also be taken into consideration.

Thirdly, a troubleshooting frequently-asked-questions (FAQs) is needed to resolve technical difficulties encountered by families before and during teletherapy. Troubleshooting was mentioned as a necessity by Constantinescu (2012). She further suggests sharing of pre-recorded therapeutic strategies/activities before the session, to ensure that families can view them regardless of the quality of the internet connection during the session itself.

Fourth, this pilot teletherapy project was conducted by the professionals outside the working hours of their daily jobs. No other literature has described their teletherapy programme providers as such. Therefore for each session, there is one hour of actual session, and another hour – 0.5 hour before and another 0.5 after – spent by each professional for the pre- and post-session preparation. The cohort involved in this pilot project is small, and therefore still feasible for the professionals to deliver teletherapy as an additional service, on top of their actual daily jobs. However, this is not sustainable for the professionals in the long run, nor for a larger group of teletherapy clientele.

CONCLUSIONS

This paper has described a pilot teletherapy project, initiated by a parent support group, to provide speech-language and literacy intervention for DHH children. The initial findings suggest positive outcomes not only for children with hearing loss in developing language and literacy skills, but also their families in supporting their child in the home setting. To the best of the authors' knowledge, there is no other similar report on teletherapy for children with hearing loss in Malaysia.

Early adopters of teletherapy for children with hearing loss, such as Australia (McCarthy et al., 2012) and the United States (Douglas, 2012), have developed a set of guidelines of service delivery in their respective countries. Although guidelines for telemedicine is available in Malaysia in the last two decades (Abushaar & Ismail, 2018), these only govern medical practitioners, and not educators or allied health professionals. Therefore, in conducting the pilot teletherapy project, the authors have referred to the literature from countries such as Australia and the United States as a guide. Recommendations for teletherapy practice guidelines are certainly needed in the Malaysian context. However, a larger data sample from a more comprehensive study is needed for the guidelines to be established.

The implementation of 'Zero Reject Policy' in 2019 by the Malaysian Ministry of Education has provided all children with access to education in the public schools, including those with special needs (The New Straits Times, 2018). The implication for this in terms of our young DHH children is that, it is highly crucial to ensure that they can acquire an appropriate level of listening, spoken language, and literacy skills through early intervention, before starting school. This is to guarantee successful mainstreaming in education, notwithstanding where their families live. To this end, teletherapy should be highlighted and systematically implemented, so that early intervention can be delivered timely and effectively.

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