Leeds Beckett University

DELIVERING THERAPY for ADULTS who STAMMER via TELEHEALTH

Evaluation Report

Foreword

There could surely be no more powerful foreword than the story of Adam, a person who stammers who participated in 7 telehealth therapy sessions over the course of 4 months. As told to Steph Burgess, speech and language therapist:

Adam works for a large company and is married with two young children. When he first came for therapy, he told me his stammer was holding him back in his career and socially. He never took his children out on his own, as he worried in case anyone asked him what their names were and he couldn't answer. On a 0-10 scale, he said he was at a 2 when he decided to ask for help, and would like to get to 8.

Straight away, Adam pushed himself out of his comfort zone. After our first session, he forced himself to make some phone calls, which he would normally have avoided. He also spoke to some colleagues about his stammer. Their response was that they'd always wondered about it but never felt able to ask about it. Once they knew, they were very supportive. Adam also took his kids to the park and for something to eat. He talked about how great that felt – like being a normal dad. He then spoke to his mum about it, which he'd never really done, and they discussed some things from his adolescence which helped him to understand why it might have become such a problem for him.

We looked at the mechanics of speech and what happens when you stammer, and experimented with some fluency techniques, mainly around breathing.

After 4 sessions, Adam said, "I can do everyday things that 'normal' people do. I used to see people chatting and think, "I wish I could do that,", and now I'm able to. I would have been hungry and wanted some food and thought, I don't want to go in there and order something, but now I do. It's amazing what you can do! It's like having a normal life!"

By the end of therapy, Adam had spoken to his manager about things and talked about going for an interview for promotion. He had set up an online self-help group within the organisation for other employees who stammer. He had written to the CEO asking what help she would give them. He had gone to a local meeting about the proposed closure of his sons' village primary school and asked lots of questions – afterwards lots of people said they were glad he'd been there because they wouldn't have dared speak out.

At our last session, Adam put himself at 9.5 on the scale.

"I've never been as happy as I am now, because of opening up to everyone and having the confidence to talk about it. I've never been able to do the things I do now. It feels great to know I'm not relying on my wife to ring up for me. It's normal stuff, which I wouldn't have done. I hope you can help other people because it opens up so many avenues. It can change your life. I've been in some dark areas and now I look at myself and I'm really happy with myself."

Six months later Adam emailed me to say he'd changed roles at work and was now in the job he'd always wanted.

Contents

Executive Summary

1. Introduction

Airedale NHS Foundation Trust have provided speech therapy via video link to adults who stammer for a number of years. One of the clients who benefited from this service wrote the story of his life-changing experience of receiving speech therapy. As a result of this story being widely shared, a collaboration was established between the **British Stammering Association** and Airedale NHS Foundation Trust to establish whether this service is something which could be extended to other adults who stammer who are unable to access speech therapy locally. The project was funded by **The Health Foundation** and evaluated by **Leeds Beckett University**.

This report presents the findings from an evaluation of the project to deliver therapy to adults who stammer via telehealth. It presents evidence about the project's background, the outcomes for participants who took part in therapy and their experiences of receiving therapy via telehealth. Key learning points and considerations for the future are discussed.

2. Background

Stammering (also known as stuttering) is a speech disorder that affects approximately 1 in 100 adults, equating to around 600,000 people in the UK. For some individuals, stammering may affect daily activities such as answering the telephone or asking for things in shops and bars. In turn, this may impact on higher education or employment choices or developing social and romantic relationships. People who stammer may be vulnerable to mental health problems such as high levels of anxiety, social phobia and reduced self-esteem. Whilst speech and language therapists can provide effective intervention for adults who stammer, there is a widespread lack of access to specialist support and records held by the British Stammering Association, who receive around 1200 enquiries per year from adults who stammer asking about access to services show that, in some regions of the UK, there is no service at all for adults who stammer.

Telehealth can provide a number of benefits including providing services for clients who cannot access local services. The aim of this project was to develop, pilot and evaluate a model of delivering therapy to adults who stammer via telehealth by establishing non-location dependent access to high quality speech and language therapy via video link for adults who stammer.

Therapy was delivered from a community clinic setting and the clients, adults who stammer, were seen via video-conference link in a place that suited them, for example, their own home, their office, or other suitable location. Intervention was identical to the approach taken in a face to face service and was delivered by a highly specialist speech and language therapist over the course of the project.

3. Evaluation aims and objectives

The evaluation used a mixed method approach including data collection from formal and informal therapy outcome measures, questionnaires about expectations and experiences of telehealth and semi-structured interviews with project participants. The specific objectives of the evaluation were to:

- gather data on speakers' experience of stammering pre- and post-therapy in order to establish whether intervention has brought about positive change for individuals who stammer
- examine clinical data (Scaling) to identify whether participants had met their therapy goals
- gain an understanding of participants' expectations and experiences of taking part in therapy via telehealth
- provide detailed insight into participants' experiences of engaging with stammering therapy via telehealth
- present informal data on the impact of therapy
- examine the perspective of the speech and language therapist in delivering telehealth
- consider the findings of this project in the context of wider literature on telehealth interventions (incomplete)
- determine key learning points and recommendations for future service provision and evaluation

4. Overall summary of evaluation findings

Therapy outcomes

- **Prior to therapy**, clients had, on average, **moderate to severe** severity impact ratings, meaning that their stammering had a significant impact on speaking, participating in activities such as socialising or working, and personal wellbeing and quality of life. **Following therapy**, the average severity impact rating was **mild to moderate,** representing **a clinically significant positive change.**
- Clinical rating scales showed that **all participants** rated their feelings about their speech **more positively after therapy than before therapy.** Out of 22 clients who completed the rating scale upon starting and completing therapy:
    - 8 reported reaching their target score
    - 2 reported exceeding their target score
    - 7 reported reaching within 1 point of their target score
- Clinical rating scales completed by 12 clients 6 months after completion of therapy showed that positive feelings about speech were **maintained**

The experience of telehealth

- **100%** of evaluation participants reported that they were comfortable using telehealth. **Following therapy, 60%** of respondents **agreed that on-line therapy is equivalent to face to face** therapy compared with 25% who agreed prior to therapy. **100%** of respondents **agreed that telehealth allowed easy access to therapy. The**

majority of respondents **agreed that it was easy to access equipment (85%), find time for therapy (100%) and a quiet space for therapy (100%).**

The impact of therapy

Many clients reported **positive differences** that therapy had made in their lives. They felt more **positive about their speech** and **took part in everyday** activities that they would previously have avoided.

5. Conclusions

The primary conclusion from this evaluation is that **effective therapy for adults who stammer can be delivered via telehealth.**

Telehealth is **convenient** for clients because it **saves time and expense** on travel. It provides **access to services** that are otherwise unavailable. For the most part, **technology works well**, providing that a reliable platform and suitable wifi access is available

Telehealth can support **successful therapy relationships** and, for some clients, is less daunting than meeting a therapist face to face

Telehealth can be delivered via a freely available platform that:

- provides **audio and video quality** of a consistently high standard (subject to broadband speed)
- is **intuitive and easy** to use
- meets **governance** requirements

Future projects should aim to:

- Further investigate therapy outcomes, particularly the long-term impact of therapy
- Explore the reasons why potential telehealth clients may fail to start or complete therapy.
- Determine the cost-base for providing therapy. Providing that standard equipment (PC or other device with camera, headphones and microphone; internet connection) is available, it is estimated that the cost is identical to that of a clinic-based therapist delivering therapy face-to-face.
- Identify training needs for telehealth delivery. Formal and informal training for both experienced and pre-registration speech and language therapists should be developed and evaluated.
- Consider the development of a protocol of delivery of speech and language therapy via telehealth.

- Engage a range of stakeholders, including commissioning groups, commissioning support units as well as private and social enterprises to explore how the unmet needs of people who stammer can be addressed through telehealth services.

1. Introduction and Background to Project

For several years, Airedale NHS Foundation Trust has been providing speech therapy via video link to adults who stammer in prison. The service is delivered by the Trust's clinical lead for dysfluency, a Highly Specialist Speech and Language Therapist. One of the clients who benefited from this service wrote the story of his life-changing experience of receiving speech therapy. He was videoed telling his story and answering questions about his experience. The full story can be accessed at http://www.stammering.org/speaking-out/article/speech-therapy-success-prison. As a result of this story being widely shared, a collaboration was established between the British Stammering Association and Airedale NHS Foundation Trust to establish whether this service is something which could be extended to other adults who stammer, who are unable to access speech therapy locally. The project was funded by The Health Foundation and evaluated by Leeds Beckett University. This report presents the findings from an evaluation of the project to deliver therapy to adults who stammer via telehealth. It presents evidence about the project's background, the outcomes for participants who took part in therapy and their experiences of receiving therapy via telehealth. Key learning points and considerations for the future are discussed.

1.1 Background

1.1.2 Stammering

Stammering (also known as stuttering) is a speech disorder that affects approximately 1 in 100 adults (Yairi & Ambrose, 2013) equating to around 600,000 people in the UK. In addition to disruptions in speech, older children and adults frequently experience 'hidden' aspects of stammering such as negative beliefs and feelings and may use avoidance strategies to manage these. Stammering has been compared to an 'iceberg' in which the speech difficulties represent a small part of the difficulty with the main issues being 'below the surface' (Sheeran, (1970). For some individuals, stammering may affect daily activities such as answering the telephone or asking for things in shops and bars. In turn, this may impact on higher education or employment choices or developing social and romantic relationships (Crichton-Smith, 2002). People who stammer may be vulnerable to mental health problems such as high levels of anxiety, social phobia and reduced self-esteem (Iverach, Rapee, Wong, & Lowe, 2017). Social stereotyping of the person who stammers may occur in education and employment (McAllister, Collier, & Shepstone, 2013). Stammering is recognised as a disability under the Equalities Act 2010.

Speech and language therapists can provide effective intervention for adults who stammer (Baxter et al., 2015). Therapy can be successful in addressing the negative impact that stammering can have on the life of an individual and needs to be tailored to the individual's situation, requiring specialist expertise. However, there is a widespread lack of access to specialist therapists and appropriate therapeutic settings and records held by the British Stammering Association, who receive around 1200 enquiries per year from adults who stammer asking about access to services show that, in some regions of the UK, there is no service at all for adults who stammer.

1.1.3 Telehealth

Telehealth can encompass telephone appointments, video-conferencing and bespoke systems. Over the past decade, interest in telehealth has grown considerably with a high demand for in-home services (Molini-Avejonas et al., 2015). Benefits of telehealth may include:

- reduction of costs (Shama et al, 2011)
- meet increased demand for clinician time (RCSLT, 2018)
- enable connection of health professionals and clients over long distances for clients who live less locally or who do not have access to local services (e.g. Georgeadis et al, 2012)
- reduction of demand on clients, particularly those receiving intensive interventions (Goldberg et al, 2012)

Within speech and language therapy, telehealth has been used to provide assessment and intervention (Theodoros, Hill, & Russell, 2016) and advice and support (Shama et al, 2015) across a wide range of speech and language therapy practice areas (Figure 1).

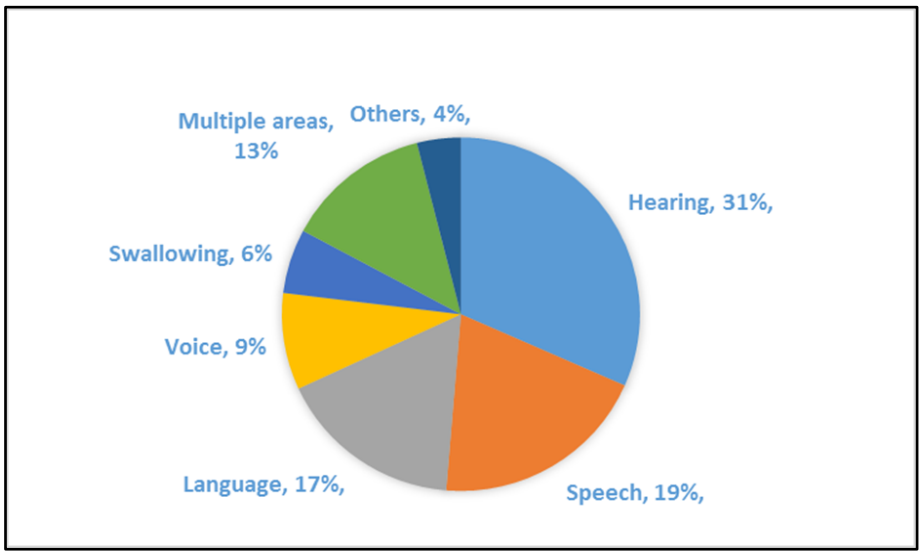

Figure 1: Speech and language therapy practice areas reporting on use of telehealth (Mooni-Avejonas, 2015)

Perhaps unsurprisingly, given their geographical scale, (Molini-Avejonas et al., 2015) reported in their systematic review of the use of telehealth in speech and language therapy that the majority of evidence has come from the USA (32%) and Australia (29%), with 85% of studies concluding that telehealth has advantages over non-telehealth alternatives. Potential barriers to the use of telehealth may include lack of access to technology, including a good quality internet connection, either within healthcare Trusts or on the part of individuals (RCSLT, 2018).

1.2 Project aims

The aim of this project was to develop, pilot and evaluate a model of delivering therapy to adults who stammer via telehealth by establishing non-location dependent access to high quality speech and language therapy via video link for adults who stammer. Participants in the project either have no local access to face to face services or are unable to access local services for other reasons.

1.3 Evaluation Approach

The approach to evaluation was informed by consideration of evaluation frameworks and previous research and used a mixed method approach. Data was collected before and after therapy using formal and informal therapy outcome measures, questionnaires about expectations and experiences of telehealth and semi-structured interviews with project participants.

The specific objectives of the evaluation were to:

- examine therapy outcomes by gathering data on speakers' experience of stammering pre- and post-therapy in order to establish whether intervention has brought about positive change for individuals who stammer
- examine clinical data (Scaling) to identify whether participants had met their therapy goals
- gain an understanding of participants' expectations and experiences of taking part in therapy via telehealth
- provide detailed insight into participants' experiences of engaging with stammering therapy via telehealth
- summarise informal data on the impact of therapy
- examine the experience of the speech and language therapist in delivering telehealth
- consider the findings of this project in the context of wider literature on telehealth interventions
- determine key learning points and recommendations for future service delivery and evaluation

2. Overview of the Telehealth project

2.1 Participants

Participants were recruited via the BSA website requesting expressions of interest in response to the following request:

'Are you looking for NHS speech therapy but cannot access it locally – perhaps because there is no service for adults where you live?'

Individuals interested in taking part were able to self-refer (no GP referral required) and needed to meet the following criteria:

- Be aged 18 or over
- Be resident in the UK
- Be able to understand and use English without the need for an interpreter
- Unable to access NHS speech therapy locally
- Have access to a computer or other device with reasonably fast broadband internet access, a webcam and either speakers or headphones
- Access to a quiet place for the therapy session

Expressions of interest were received from across England, Wales and Northern Ireland with the highest concentration being from London and the south east (Figure 2).

Figure 2: Location of participants in telehealth project

Recruitment figures are summarised below:

Project Stage	
Expressions of interest	65
Number of people 'signed up' for therapy	43
Number of people who started therapy	33
Number of people who completed therapy	29

Figure 2: Participant numbers at different stages of project

The pathway from referral to discharge is summarised in Appendix 1.

Although an attempt was made to determine reasons for people not starting therapy after expressing interest/ 'signing-up' or for not continuing with therapy, no responses were received. Anecdotally, the following reasons were provided by 3 people in response to email queries from the project delivery team:

- Unable to find suitable time / space
- Unexpected illness of family member
- Only available at weekends (therapy appointments offered between 10 am and 6pm)

The average age of those taking part was 32 (range of those who completed outcome questionnaires 22-46). Sixty-five percent were male and 35% female. Approximately 4 times as many adults who stammer are male than are female and so the proportion of females accessing therapy is somewhat higher than might be expected.

2.2 Technology Platform

In the initial stages of the project, a number of options for the delivery of therapy were explored. Initially, WebEx (https://www.webex.co.uk/), a free platform providing video meeting and screen sharing facilities was used. Technical difficulties (frozen screens and connections 'dropping out') made this platform unreliable. An alternative, Appear.In (https://appear.in/) was selected, offering the same functionality and greater reliability.

Participants used Smart-phones, tablets and PCs or laptops to access therapy.

2.3 Therapy

Therapy was based in a community clinic setting, and the clients, adults who stammer, were seen via video-conference link in a place that suited them, for example, their own home, their office, or other suitable location.

Intervention was identical to the approach taken in a face to face service and was delivered by a highly specialist speech and language therapist over the course of the project. Therapy was individualised and integrated behavioural strategies to manage moments of stammering with identifying and challenging negative thoughts and feelings associated with stammering. Example therapy activities included:

- Identifying feared situations
- Behavioural experiments, 'trying things out'

- Educating clients on the mechanism of speech production and raising awareness of the role of breathing

The number of sessions for each client ranged from 3 to 10 (average, 6.2). Each session lasted approximately 1 hour. Following each session, the therapist sent a detailed email to the client summarising the session and any agreed activities for the client to undertake before the next session. The email also served as patient record. The speech and language therapist reported that this process is identical to face-to-face therapy sessions.

3. Findings

Findings from the evaluation address the objectives of examining clinical outcomes and exploring the experience of using telehealth from the perspective of clients and the speech and language therapist.

3.1 Therapy Outcomes

Therapy outcomes were examined by collecting quantitative data from formal and informal measures.

3.1.1 Overall Assessment of the Speaker's Experience of Stuttering (OASES)

The OASES (Yaruss & Quesal, 2006) is a formal, 100-item comprehensive measurement tool designed to document the entirety of the stammering disorder from the perspective of the person who stammers. It is a commonly used outcome measure in stammering research and practice and is based on the International Classification of Functioning, Disability and Health (ICF), the World Health Organisation's framework for measuring health and disability at both individual and population levels. The OASES is structured in 4 parts, summarised in table 2 below:

OASES Section	Example Items
Section I: General information about stuttering: measures the speaker's perception and general knowledge about stammering	How often do you say exactly what you want to say, even if you think you might stammer? Overall, how do you feel the way you sound when you speak?
Section II: Speaker's affective, behavioural and cognitive reactions to stuttering	When you think about your stammering, how often do you feel ashamed? How often do you experience physical tension when stammering?
Section III: Communication in daily situations	In general, how difficult is it for you to introduce yourself? At work, how difficult is it to use the telephone?
Section IV: The impact of stuttering on quality of life	How much does stammering interfere with your relationships with family? How much does your stammering interfere with your sense of worth or self-esteem?

Table 2: OASES sections and example items from the tool

Administration of the OASES gives a series of impact scores and impact ratings which can be calculated for each section as well as for the measure as a whole (table 3).

Impact Score	Impact Rating
1.00 – 1.49	Mild
1.50 – 2.24	Mild-to-moderate
2.25 – 3.99	Moderate
3.00 – 3.74	Moderate-to-severe
3.75 – 5.00	Severe

Table 3: Impact scores and impact ratings for the OASES

A total of 16 participants completed the OASES both pre-and post-therapy. Impact scores pre and post therapy across all sections are summarised in Figure 2.

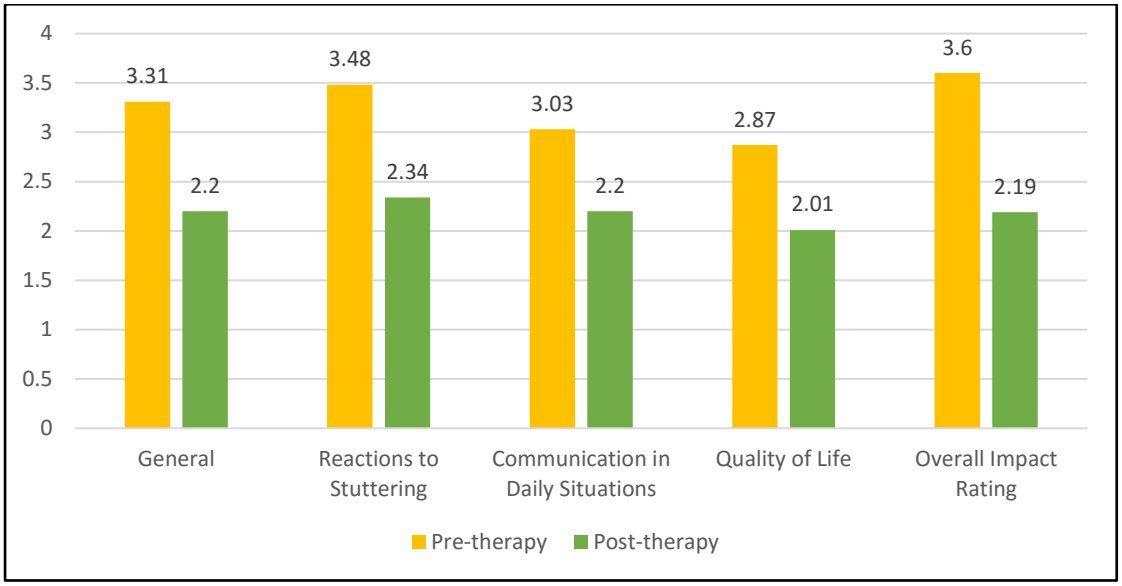

Figure 2: OASES Scores pre- and post- therapy

Key outcomes of the OASES formal therapy outcome measure:

- **Prior to therapy**, participants had, on average, **moderate to severe** severity impact ratings in each section of the OASES and in the overall impact score.
- **Following therapy**, the average severity impact rating was **mild to moderate** for each section of the OASES, with the exception of 'reactions to stuttering' which was just into the moderate rating.

3.1.2 Scaling Scores

Scaling is an informal clinical outcome measure originating in solution focused brief therapy. It is commonly used by speech and language therapists in the UK who work with older children and adults who stammer. Data is collected by the speech and language therapist delivering therapy. The procedure is as follows:

Prior to therapy, clients are asked:

"On a scale from 0 to 10, where 0 is the worst you have ever felt about your speech and 10 is the best you can imagine feeling":

- where are you now?
- where would you like to be (target score)?

At the final appointment, the client is asked to rate the 'where are you now' question again.

A total of 22 clients completed the scaling questions immediately before and immediately after therapy (Figure 3).

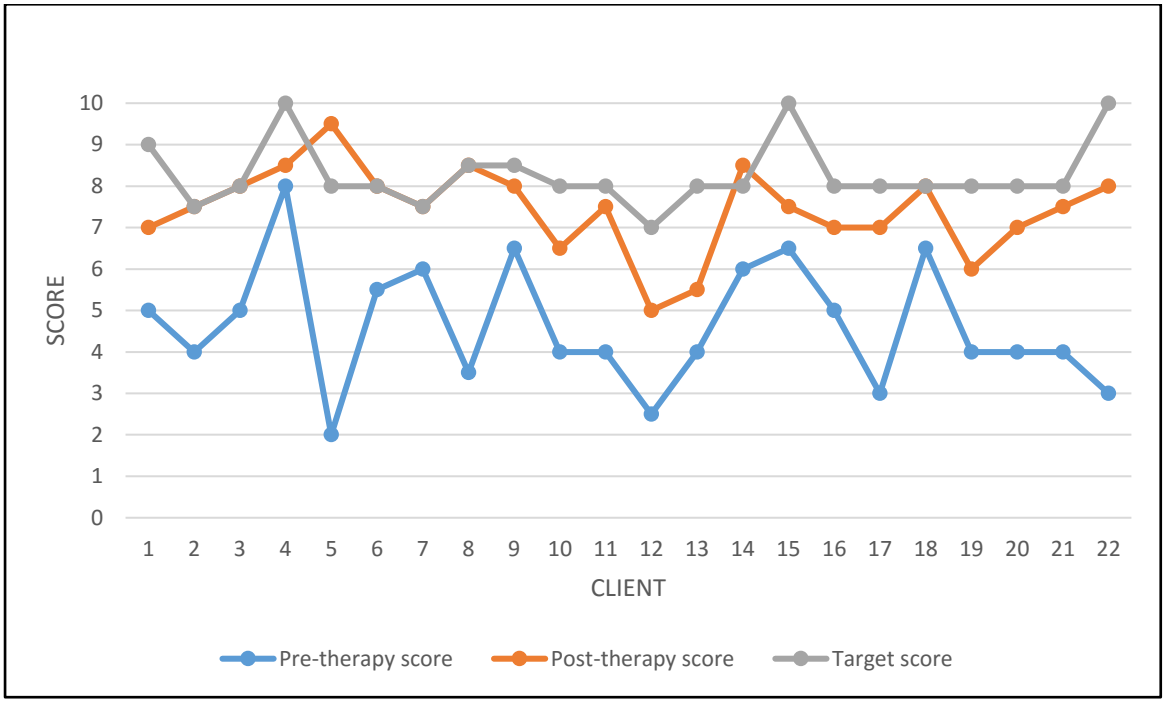

Figure 3: Scaling Scores immediately pre-and post-therapy (22 clients)

Additionally, 12 clients completed the 'where are you now' scaling question at approximately 6 months post-therapy (Figure 4).

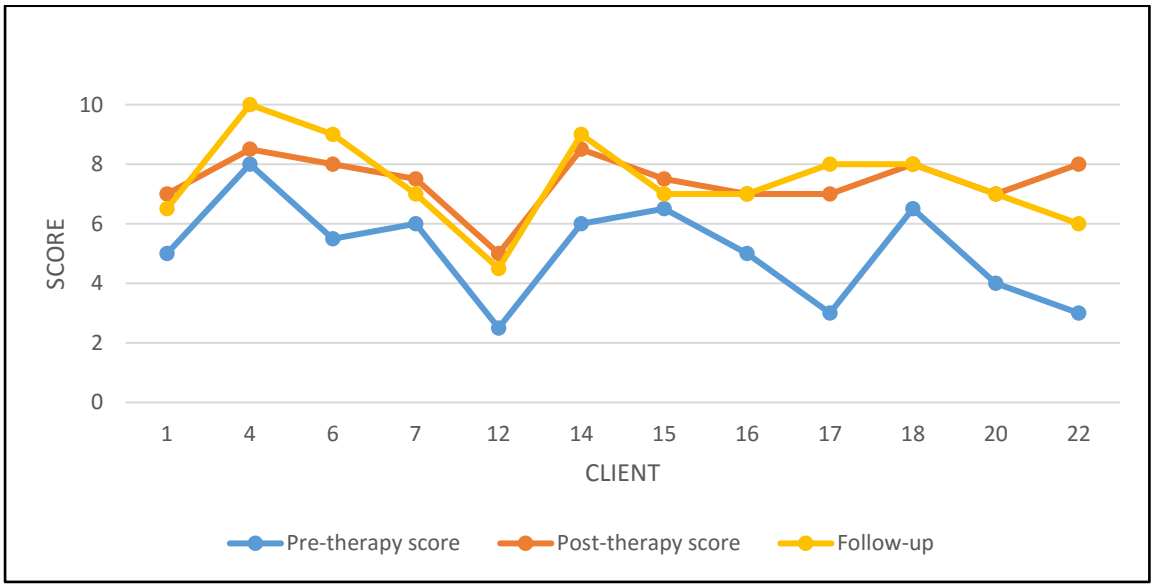

Figure 4: Scaling Score (available for clients shown, n=12)

Key outcomes of the Scaling informal therapy outcome measure:

- **Prior to therapy,** participants recorded scaling scores, on average, as **4.6** (range, 2.-6.5). **Immediately following therapy,** the average scaling score was **7.4** (range 5-9.5)
- All participants rated their feelings about their speech more positively after therapy than before therapy
- 8 clients reported reaching (and, in 2 cases, exceeding) their target score following therapy
- A further 7 clients reporting reaching within 1 point of their target score
- For the 12 participants who completed the scaling question at **6 months post-therapy,** the average scaling score was **8** (range 4.5-10)

3.2 Client Experiences of Telehealth

Client experiences of telehealth were examined through a questionnaire, obtaining quantitative and qualitative data and through interviews.

3.2.1 Quantitative Data: Expectations and Experiences of Telehealth

As there is no standardised tool for evaluation of client perceptions of telehealth, a questionnaire was adapted from one used in previous studies, e.g. Sharma et al, 2015. Both the pre- and post-therapy questionnaire consisted of the same 10 items which examined perceptions regarding (1) level of comfort with telehealth (3 items), (2) audio and video quality (2 items), (3) practicalities associated with telehealth (3 items) and (4) general considerations about telehealth (2 items). In the pre-therapy questionnaire, questions were worded in the future tense (e.g. It will be easy for me to access the equipment needed for telehealth). The post-therapy questionnaire contained the same questions worded to reflect the past tense (e.g. it was easy for me to access the equipment needed for telehealth). Participants responded to each statement using a 5-point Likert scale (1=strongly agree to 5=strongly disagree). In the pre-therapy questionnaire, participants had the opportunity to provide open-ended comments about their reasons for taking part in the project as well as

expectations. In the post-therapy questionnaire, there was opportunity for open-ended comments on what has been positive and difficult about telehealth as well as advice to anyone considering telehealth in the future.

A total of 23 participants completed the 'Expectations of Telehealth' questionnaire prior to therapy and 12 participants completed the 'Experiences of Telehealth' questionnaire post-therapy.

Responses to the Likert scale items are summarised in Figure 5 and Table 4.

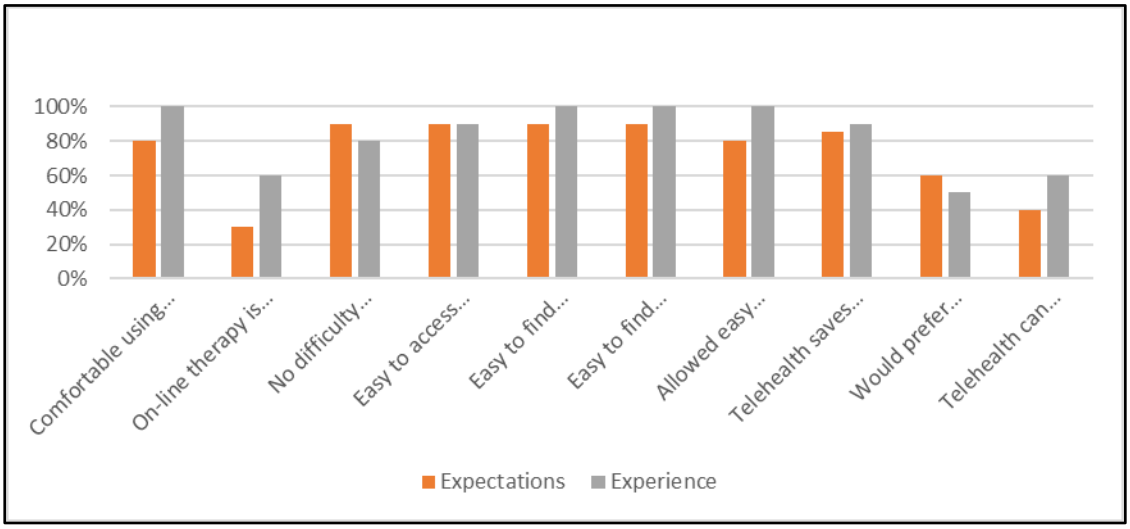

Figure 5: Expectations and experiences of telehealth

Statement	Expectations % Agree	Experience % Agree
Comfortable using telehealth	80%	100%
On-line therapy is equal to face to face	25%	60%
No difficulty seeing/ hearing the therapist	90%	80%
Easy to access equipment needed	90%	90%
Easy to find private space	90%	100%
Easy to find convenient time	90%	100%
Allowed easy access to healthcare	80%	100%
Telehealth saves time & money	85%	90%
Would prefer telehealth to face to face therapy	60%	50%
Telehealth can replace face to face therapy	40%	60%

Table 4: Expectations and experiences of telehealth

Key findings from the Experiences and Expectations of Telehealth Questionnaire:

- 80% of participants who responded *expected* to feel comfortable with using telehealth and 100% reported that they *were* comfortable using it.
- Following therapy, 60% of participants agreed that on-line therapy is equivalent to face to face therapy compared with 25% who agreed prior to therapy
- 100% of participants agreed that telehealth allowed easy access to therapy
- 85% agreed that it was easy to access equipment
- 100% agreed that it was easy find time for therapy and 100% agreed that it was easy to find a quiet space for therapy (100%).

3.2.2 Qualitative Data: Expectations and Experiences of Telehealth

Semi-structured interviews were conducted with 8 participants. Interviews explored reasons for seeking therapy, experiences of therapy via telehealth and recommendations for the future. Additional qualitative data was collected from open ended comments in the Expectations and Experiences of Telehealth Questionnaires.

3.2.2.1 Reasons for taking part: General reasons related to stammering

Participants referred to a range of reasons for seeking therapy at this point in their lives. These included:

- a **specific event** that requires speaking:

  "My stammer has been a problem since I was a child. I feel it's affecting my life & I can't communicate with people as I want to….the biggest reason for starting this is because I am one of the best men at my brother's wedding."

  "in my third year of university when I knew that I would have my first and only presentation that I would have to give. This presentation was at the end of my degree for my final project……. And the anxiety was just building up. And I knew that I had to do something with it."

- **career development**:

  "I have had a stammer since childhood and it would benefit my career to improve my verbal fluency."

  "so I was in the design team at work, which meant that I would have to talk to a lot of people….., and to give presentations, which is something that I wouldn't be able to, and I would be very disappointed in myself, thinking that I couldn't do my job very well. And I would be basically not able to speak in meetings and I would keep very quiet. …… in my annual review, where I felt that my manager and my reviewer would be quite disappointed with my performance because I was very disappointed with it, not being able to speak in presentations and meetings as I would want".

- **personal feelings** about stammering

  "I have had a stammer all my life. I am now 21 and feel like it has got worse. It is really getting me down and making me feel worthless"

3.2.2.2 Reasons for taking part: The convenience of telehealth

Six participants referred to the **convenience** of telehealth. For example:

> "*Accessible speech therapy that works around my timetable and no travel expenses"*
>
> *"As a researcher who moves a lot, having consistent access to a therapist is difficult. This telehealth project is the perfect solution for people like me".*
>
> *"I like with telemedicine, I think it offers so much flexibility. Because one of the things of going somewhere and doing this in person would be that I would know that every Thursday, let's say from 10 to 11, I would have to be in location x. But with telemedicine, I found that I could just take video calls from home and I have more flexibility in that respect; and it would save me travelling time and money. Those have been really important things - that I can do this therapy in private and that it's easily accessible."*
>
> *"Telehealth was more convenient for me to have sessions during working hours without the added commute time if attending face to face"*
>
> *"It's quite a flexible way of having the therapy… we can be at home, we can be at work… it's fantastic."*

Two participants referred to difficulties with identifying suitable times for therapy appointments:

> *"Keeping appointments as they are during the work day."*

"The main difficulty was agreeing suitable times … due to the demand."

A further 2 participants expressed concerns about finding a private space for therapy:

"Difficult to find a private space at work"

"Finding a suitably quiet place for the session"

3.2.2.3 Reasons for taking part: Access to services

Seven participants explained that telehealth gave them **access to services** that they wouldn't otherwise have. For example:

"I have struggled to access and receive any type of treatment for years."

"The lack of SLT support in my local area."

"There is a lengthy waiting list for face to face speech therapy. I have a positive attitude towards technology and trying new things."

3.2.2.4 Technology

Prior to starting therapy, 2 clients expressed minor concerns about technology

"I'm not sure I have a webcam. Can we use Skype?"

"Unstable connections sometimes could break up conversations."

Overall, the participants interviewed had positive experiences with using the technology:

"From a technological point of view, apart from the odd occasion when there was minor glitches, I suppose the quality was very good. It could have been improved to excellent but still very good."

"Generally speaking, it was very good but there were moments where, visually, it would freeze and also a couple of times, the sound was silent…maybe 5% of the time. So, the conclusion I would take from that is that, for the majority of the time, it was very good."

"Only problem was mode of delivery. We first used WebEx, which sometimes didn't work well – wifi dropped frequently as I had to use my mobile and not desktop as have no web camera. Appear.In was much better but, again, sometimes wifi dropped. This might not be a problem with clients using their home wifi."

3.2.2.5 Building a relationship with the therapist

Participants had differing views about the impact of telehealth on building a relationship with the therapist. Three participants referred to challenges of working through telehealth in this regard:

"Of course I wish we could have been in the same room….and having even at the beginning of a meeting, for example, those small interactions and exchanges of. 'Hi. How was your day'… something like this, which is more difficult over the internet. And being in the same room…feels a little bit more intimate in some way, like we're sharing the same room and what we speak about in this room stays in this room."

"I felt a little bit that the human experience was missing."

"Seemed a bit impersonal and maybe I wasn't as engaged."

However, for others, there were no issues, for example:

"*We build up a really good rapport, really good functional relationship…. I believe when two people feel more conformable, then they're more likely to be honest and that will lead to a more positive outcome as well."*

One participant referred to the **benefit** of working with a therapist via telehealth, compared with face-to-face:

"The fact that things were from a computer and that made it a lot easier to reach out to (therapist) … I felt more comfortable to ask questions….I would say there was less pressure for me over a computer and seeing someone on camera, that make things a lot easier for me to communicate with them."

3.2.2.6 Telehealth as therapy

Three participants referred to the therapeutic benefit of telehealth itself:

"The fact that it is telehealth. Combines talking over the telephone practice, it is less embarrassing for me."

"An advantage of using telemedicine is that you're actually practising over the 'phone."

"I feel that speaking over the telephone and actually doing it via telemedicine actually takes you out of your comfort zone, so I think it can be really helpful."

3.3 Therapist Experience of Telehealth

Experiences of the therapist were explored though a semi-structured interview. Key points are summarised below:

3.3.1 Technology

Getting technology 'right' from the outset was a key learning point. in the initial stages of the project, a large amount of time was spent identifying and testing **appropriate IT platforms**. Key considerations were:

- that the audio and video quality were consistently of a high standard
- that the platform was easy and intuitive to use

- that it should meet governance requirements

3.3.2 The process of therapy

Building a rapport with clients is important. However, the therapist did not perceive any real difference in the **development of a therapeutic relationship** via telehealth or face to face:

> *"I have never found it to be an issue. I don't feel there is any difference in the relationship I have with the patients I have seen in this way, and the clients I have seen face-to-face, actually."*

The therapist noted that student therapists whom she had talked to may feel that telehealth could never be as good as face to face therapy:

> *"Their feeling was, very strongly, that this could never be as good as face to face and you would never get the rapport quite the same."*

Points to note are:

- Some clients had reported to the therapist that therapy seemed 'less daunting' or that there was a 'barrier' which, in fact, made talking about personal matters easier that it would be when working face-to-face.
- The start of therapy is 'more sudden' than with face to face therapy. Therapists using telehealth should be aware that the client may not be as mentally prepared as they would be if they were entering the physical environment of a clinic or waiting room.

3.3.3 Practical considerations

Some practical considerations when delivering therapy via telehealth include:

- It is particularly important to be 'very on-time' so that clients weren't in the online waiting room, wondering what was happening
- Sending an email reminder to clients ('ready when you are', with a link to the meeting) helps to prompt clients who may have forgotten to log-on
- Screen sharing was important to provide clients with materials. A folder on the desk-top ensures that things are easily accessible during the session.
- As with face-to-face therapy, an email was sent to clients at the end of each sessions summarising:
    - Key points from the session
    - Targets and practice for the following week

3.4 The Impact of Therapy

The therapist who delivered therapy gathered informal feedback about the impact of therapy from clients approximately six months after they had completed therapy. Responses are summarised here.

Do you feel differently about your stammer now?

I think I do not try to desperately hide it anymore. I am more tolerable towards myself and do not worry so much what people think about my stutter. Additionally, I hardly ever avoid intended words and try to embrace my speech

Recently I had to sort out some important things via the phone and found that I was more fluent the longer the phone call went on, which in turn made me more confident.

I don't recall avoiding situations now due to my stammer. As a father, husband, graduate and someone chasing new opportunities it's important that I face all challenges, even ones where my speech may be problematic. I also believe I more accepting of my stammer so this also helps me in all situations.

I don't avoid situations now. I feel like I have so much more confidence, you have helped me so much I will forever be in debt to you

It was a revelation that when I was holding a training course I introduced myself as a stammerer, as since then I very rarely have negative feelings about my stammer (though of course it is a pain sometimes).

I do not see my stammer as negatively as I did before as you gave me confidence that it was not the end of the world to have a stammer a thought which I had previously. This has allowed me to be more confident in saying how I feel at work even though this could be improved.

I feel as if I can finally accept being a stammerer without feeling ashamed. I also feel brave enough to tell others that I stammer.

I do indeed feel differently about the stammer, as now I see it as less of an obstacle. I am not worried as much and less apprehensive so much about how I perform in scenarios including presentations, interviews or social gatherings

Do you feel you have more control over your speech?

I believe I have more control over my speech due to the techniques I learnt with you, which has allowed me to have more conversations.

I'd say I definitely have more control, the techniques such as easy onset have really improved my block stammer.

I'm also managing it a bit better now and I think my speech has improved. I'm now more calm when I speak or maybe I just don't pay much attention to the stammer as much.

Yes I believe I do - I am able to incorporate some of the techniques that were practiced during therapy, especially the sliding technique

I feel I have more control over my speech because I am able to get my words out without substituting.

Are you doing things you previously didn't do?

During the therapy I spoke about disliking phone conversations. Although I am still not a fan, I am trying to put myself in these types of situations to develop and become more comfortable. I can see a difference and I am no longer as anxious about speaking on the phone.

I have been making lots of calls myself and booking appointments.

I'm able to place an order at a restaurant confidently, so I don't have to resort to pointing at the menu or typing what I want on my phone.

Applying for jobs etc despite the stammer which is a HUGE step for me

Do you avoid situations less? Please give examples.

I avoid public speaking situations a lot less, for example I've given two speeches at a toastmasters meeting and I've done several presentations at a careers workshop. I've felt brave enough to introduce myself at career networking events too.

3.5 Summary of Findings

Key conclusions from the evaluation fall into 2 major categories: clinical outcomes and the experience and practicalities of delivering therapy via telehealth.

3.5.1 Clinical Outcomes

The principal finding of the evaluation is that telehealth can provide effective therapy for adults who stammer.

- **Prior to therapy**, participants had, on average, **moderate to severe** severity impact ratings, meaning that their stammering had a significant impact on speaking, participating in activities such as socialising or working, and personal wellbeing and quality of life. **Following therapy**, the average severity impact rating was **mild to moderate,** representing **a clinically significant positive change.**

- Clinical rating scales showed that **all participants** rated their feelings about their speech **more positively after therapy than before therapy.** Out of 22 clients who completed the rating scale before and after therapy:
    - 8 reported reaching their target score
    - 2 reported exceeding their target score
    - 7 reported reaching within 1 point of their target score

3.5.2 The Experience of Telehealth

- **100%** of participants who responded reported that they were comfortable using telehealth. **Following therapy, 60%** of respondents **agreed that on-line therapy is equivalent to face to face** therapy compared with 25% who agreed prior to therapy. **100%** of respondents **agreed that telehealth allowed easy access to therapy. The majority** of respondents **agreed that it was easy to access equipment (85%), find time for therapy (100%) and a quiet space for therapy (100%).**
- Telehealth is **convenient** for clients because it **saves time and expense** on travel. It provides **access to services** that are otherwise unavailable.
- For the most part, **technology works well**, providing that a reliable platform and suitable wifi access is available
- Telehealth can support **successful therapy relationships** and, for some clients, is less daunting than meeting a therapist face to face
- It can be noted that, once therapy had started, there was only a small drop-out rate (4 out of 33).

3.5.3 The longer-term impact of therapy

Therapy can make a significant positive impact for people who stammer. Clients who responded to the request for their experiences 6 months after receiving therapy reported benefits from being more open about stammering, using techniques to help reduce stammering and engaging in situations that they would previously have avoided.

4. Discussion

4.1 Therapy Outcomes

This evaluation was a small group pre- post- study design and can be considered a Phase I preliminary research trial (Robey, 2004) investigating therapy outcomes. It adds to some existing evidence that delivering therapy for adults who stammer via telehealth is both safe and feasible (Lowe, O'Brian, & Onslow, 2013) and provides evidence that, for those who completed intervention, therapy was effective.

Most previous published research into telehealth delivery of treatment with adults who stutter measured effectiveness of treatment through assessment of stammering severity in percentage syllables stammering and/ or self-reported stammering severity (Lowe et al., 2013; McGill, Noureal, & Siegel, 2018). This reflects the fact that the majority of studies to-date focused on the delivery of the Camperdown Program, a type of therapy that uses a prolonged speech technique to directly target the disruptions to speech that characterise stammering.

This evaluation did not seek to directly measure outcomes in terms of the severity of speech symptoms although Section I of the primary outcome measure (OASES) does consider self-reported evaluation of speech. The choice of the OASES as the primary therapy outcome measure is appropriate to the holistic approach to therapy used here which addressed the psychological and social aspects of stammering as well as speech itself. Baxter et al (2015) discuss the wide variety of outcome measures used in stammering intervention research and note the importance of considering the *impact* of changes in stammering severity as well as the appropriacy of using outcome measures that reflect the aims of intervention such as changes in self-perception and communication attitude. They note the urgent need to better understand the degree to which intervention outcomes reflect the everyday lives of the person who stammers. Although informal, the Scaling data and comments from clients about the impact of therapy also suggest that it has had a positive effect on day to day activities that most people take for granted.

This evaluation is the only known investigation of the impact of a telehealth-delivered holistic therapy for stammering which evaluated outcomes using a tool, the OASES, that measures the impact of intervention across a range of cognitive, affective and behavioural elements as well as considering day-to-day activities and quality of life. As such, it makes a unique contribution to what is known in the field.

4.2 The Client Perspective

Previous research investigating telehealth delivery of therapy for adults who stammer has generally reported briefly, if at all, on client experience and satisfaction. Clients have reported being satisfied with the technical and clinical aspects of telehealth, appreciating not having to travel long distances and finding therapy easy and convenient (Lowe et al, 2013).

The qualitative data collected as part of this evaluations concurs with previous findings in relation to convenience. In addition, it demonstrated that it can provide access to services that would not otherwise available. Previous research from both speech and language therapy more widely and stammering in particular has been primarily based in Australia and

the US (Lowe et al., 2013; Regina Molini-Avejonas et al., 2015). This evaluation confirms that telehealth is not only relevant in rural or remote locations; in fact, the majority of participants were located in, or within travelling distance of, major cities, including London. Seven of the 8 participants interviewed expressed the value of access to therapy provided by telehealth.

Clients who took part in interviews were able to reflect on the therapy relationship. Whilst some felt that they might have preferred to be in the same room, others felt that rapport was readily developed. Some expressed the view that it was, in fact, useful since it provided telephone practice, a speaking situation which many people who stammer find particularly challenging (James, Brumfitt & Cudd, 1999).

4.3 The Therapist Perspective

This evaluation explored the views and experience of a single therapist involved in delivering therapy. The therapist was confident and experienced in working with people who stammer and with delivering therapy via telehealth. She was skilled in the use and presentation of on-line materials and perceived it was possible to develop a successful therapeutic relationship.

Research exploring therapist attitudes towards and experiences of telehealth has identified a broad range of views within the profession. Perceived advantages of telehealth include (Hill and Miller, 2012, p113):

- **Access**, including equitable access to services and ease of sharing materials.
- **Time efficiency**, for both client and clinician, particularly reduced travel time
- **Cost efficiency**, in terms of travel expenses and reduced time away from work for clients
- **Caseload management**, through increased flexibility, easier organisation of appointments and ability to manage clients one after another with less preparation of materials since these are shared 'online'

Perhaps one of the most surprising findings was that respondents reported **client focus** as a benefit. It was felt that telehealth enabled a greater intensity of treatment and more frequent reviews. Clinicians were also able to gain a more realistic idea of clients' abilities in their natural environment and, crucially, felt that the client may take greater responsibility for their own therapy.

Nevertheless, some practitioners may remain reluctant to accept telehealth as a delivery service (Molini-Avejonas et al, 2015). Studies have reported that problems with technology and connectivity, lack of confidence in technology skills, concerns about the ability to develop a therapeutic relationship and concern about suitable therapy materials may be perceived as barriers to telehealth use (Tucker, 2012; Dunkley et al, 2010). Difficulties with connectivity can result in audio and video disruption which can impact on turn-taking, conversational pace and the interpretation of facial expression or gesture (Pitt et al, 2018).

May and Erikson (2014) explored barriers to speech and language therapists using telehealth through a survey. For key areas were identified (p148-149):

- **Lack of information**, for example, about what telehealth consists of and platforms that can be used. The need for practice guidelines, technical and troubleshooting instructions and an increased evidence base were also identified.
- Closely related to the point above was the need for **training**. Most SLPs felt that they would be likely to learn through 'trial-and-error and would appreciate the opportunity for training programmes including practical demonstration.
- **Clinician attitudes and perceptions,** including the belief that that telehealth was only relevant in remote or rural settings or was the preserve of specialist centres. As reported in other studies, fear of technology was a key factor and some clinicians felt that rapport building would be negatively affected. And that a relationship approach to therapy was not possible via telehealth.
- **Organisational and policy barriers**, including lack of access to appropriate equipment or private office space and organisational policies on using platforms such as Skype for reasons of security and confidentiality.

Speech and language therapists may feel that adjusting to telehealth is equivalent to learning a new clinical skill and there is potential for negative impact if they feel that standards are not met (Pitt, Hill, Theodoros, & Russell, 2018). Nevertheless, it is also an opportunity to learn new skills and increase job satisfaction (Pitt et al, 2018). Whilst training is seen as beneficial, there are currently no formalised training programmes within the UK that focus on remote delivery of speech and language therapy.

However, studies have also revealed a positive attitude to telehealth. Whilst technology 'glitches' remain, therapists have reported that online therapy is convenient (Simic et al, 2016) and improves access to services (Hill and Breslin, 2016). Once clinicians become familiar with technology, they become more confident and effective in its use and, in turn, more likely to recognise the benefits of telehealth and feel more willing to implement it. (Overby, 2018) recommends that pre-registration training courses should consider developing the skills and competencies that students might need for telehealth practice such as **clinical skills**, including selecting and preparing online materials and interpersonal engagement over the internet, technology skills and knowledge of legal issues. This chimes with the experiences of the therapist delivering therapy in this project who noted that students who had not taken part in telehealth sessions themselves expressed doubt whether a rapport could be developed using telehealth.

4.4 Technology

Previous research exploring the telehealth delivery of treatment for adults who stutter reported on delivery via telephone (e.g. Carey et al., 2010) or, as used in this project, home-based video conferencing using personal computers and webcams (e.g. Erickson et al, 2012). Whilst freely available applications such as Skype together with the proliferation of mobile technology such as Smartphones have the potential to increase accessibility of telehealth, the security and privacy of these is uncertain and the ethical and legal obligations of healthcare providers requires careful consideration. The platforms used in this project (namely WebEx and AppearIn) were reported to have been deemed acceptable by Information Governance

within the Trust delivering the therapy, with the latter providing more consistent and reliable video quality.

5. Conclusions and considerations for the future

5.1. Conclusions

The primary conclusion from this evaluation is that **effective therapy for adults who stammer can be delivered via telehealth.**

Telehealth is **convenient** for clients because it **saves time and expense** on travel. It provides **access to services** that are otherwise unavailable. For the most part, **technology works well**, providing that a reliable platform and suitable wifi access is available

Telehealth can support **successful therapy relationships** and, for some clients, is less daunting than meeting a therapist face to face

Telehealth can be delivered via a freely available platform that:

- provides **audio and video quality** of a consistently of a high standard (subject to broadband speed)
- is **intuitive and easy** to use
- meets **governance** requirements

5.2 Considerations for the future

Future projects should aim to:

- Explore the reasons why potential telehealth clients may fail to start or complete therapy. Participants in this project who completed therapy and took part in the evaluation are a self-selecting group who are likely to feel positively about telehealth. It would be helpful to determine whether there are systematic reasons for withdrawal so that these can be addressed, as appropriate.
- Where possible, further investigate therapy outcomes using robust research designs. This might include direct comparison of therapy delivered via telehealth with face to face delivery. For practical reasons, however, single case study research designs could also be considered (Bothe et al, 2006). Future evaluations should continue to focus on the clinical impact of intervention.
- Establish longer term outcomes for clients who stammer (6 months+ post-therapy). It is important to acknowledge that this may be challenging since engagement with formal research outcome measures even immediately post-therapy was relatively low (less than 50% of those who participated in therapy). Informal clinician-led follow-up data was available and showed positive gains 6 months following the completion of therapy, although this needs to be treated with some caution since data was not collected independently.
- Determine the cost-base for providing therapy. This was not part of the remit of this evaluation and is an important factor in considering a wider roll-out of telehealth for people who stammer. Providing that standard equipment (PC or other device with camera, headphones and microphone; internet connection) is available, it is estimated that the cost is identical to that of a clinic-based therapist delivering therapy face-to-face.

- Identify training needs for expansion of the project. Telehealth therapy for this project was delivered by a single speech and language therapist who had experience of telehealth over a number of years. Literature suggests that speech and language therapists more widely may recognise the benefits of telehealth but feel under confident in their ability to deliver it. Formal and informal training for both experienced and pre-registration speech and language therapists should be developed and evaluated.
- Consider the development of a protocol for delivery of speech and language therapy via telehealth.
- Engage a range of stakeholders, including commissioning groups, commissioning support units as well as private and social enterprises to explore how the unmet needs of people who stammer can be addressed through telehealth services.

6. How we did the evaluation

The evaluation was conducted by the Speech and Language Sciences Group from Leeds Beckett University between 2017 and 2018.

The evaluation used a mixed method approach including data collection from formal and informal therapy outcome measures, questionnaires about expectations and experiences of telehealth and semi-structured interviews with project participants. The specific objectives of the evaluation are outlined above.

6.1 Approach to Data Collection and Analysis

6.1.1 Quantitative Data

Scores from the primary therapy outcome measure (OASES) were collected from 23 participants prior to starting therapy. The OASES was completed on-line via a link that was emailed to participants. Twelve participants completed the OASES following therapy. Data presented here is from clients who completed the OASES at both time points. Data was imported into Excel for descriptive statistical analysis. Mean scores on each section and an overall score are presented. Due to the small sample size relative to the number of items on the OASES, it was not considered appropriate to undertake inferential statistics.

The Expectations of Telehealth Questionnaire was completed online by 23 participants and the Experiences of Telehealth questionnaire completed by 12. Percentage of participants who agreed with each statement is presented.

6.1.2 Qualitative Data

Semi-structured interviews were conducted with 8 participants. Interviews explored reasons for seeking therapy, experiences of therapy via telehealth and recommendations for the future. A topic guide based on a review of the literature (Appendix 1) was used to structure the interviews. Interviews took place over the telephone and were recorded and transcribed verbatim. Additional qualitative data was collected from open ended comments in the Expectations and Experiences of Telehealth Questionnaires.

The verbatim transcripts from the interviews and qualitative comments from the Expectations/ Experiences of Telehealth questionnaires were analysed using Thematic Analysis (Braun and Clarke, 2006). Thematic Analysis involves familiarisation with the data, followed by development of themes and codes which are reviewed and defined. Analysis was informed by the objectives of the evaluation.

6.2 Research Ethics

The evaluation was given ethical approval through Leeds Beckett University ethics procedures. The following practices were adhered to:

Informed consent: participants received written information about the purpose and methods of the evaluation and had the opportunity to ask questions. Written or verbal consent was obtained from all clients who participated in interviews.

Confidentiality and anonymity: no personal identifying information has been used in the reporting of this data. All data is stored separately from client personal information.

Secure information management: All data and participant information is stored on password-protected University systems

6.3 Limitations of the Evaluation

Certain caveats need to be noted when considering the data in the evaluation. Firstly, the total number of participants overall was quite small. In particular, there was a significant 'drop-off' in the number of individuals who completed the questionnaire following therapy (12) compared to those who completed pre-therapy questionnaires (23). There may be a number of reasons for this; it may be that participants who did not complete therapy (perhaps because they were dissatisfied with it) or who completed therapy but did not feel they benefitted from it may have been less likely to complete follow-up questionnaire. Equally, it also is possible that participants who had a range of views may simply felt less motivated to engage with the evaluation process following therapy. Since we were unable to gain responses from people who discontinued therapy, it is difficult to interpret this phenomenon. Future evaluations should continue to make efforts to collect independent data from as many participants as possible, including those who discontinued therapy. This evaluation presents data from participants who completed evaluation measures (OASES and Expectations/ Experiences of Telehealth) at both time points only. The scaling data provided by the therapist was more complete, with 22 completions pre- and post-therapy and a further 12 at 6-months follow-up. However, this data cannot be considered independent since clients may have some sort of obligation to respond positively. Nevertheless, the 'completeness' of the data and the fact that all participants who completed the measure showed an increase in their score does provide compelling 'informal' evidence of the success of therapy.

Secondly, the evaluation was, for practical reasons, a pre- post- intervention design. The absence of a control group consisting of either no therapy or face-to-face therapy means that, although a positive change in outcomes measures was *associated* with telehealth therapy, is not possible to say definitively whether therapy delivered via telehealth was the *cause* of changes in the outcome measures or whether there is a difference in outcomes compared with therapy delivered face to face. However, prima facie, both the OASES and the scaling data, as well as the informal feedback 6 months after therapy, indicates that therapy 'made a positive difference'.

Finally, it needs to be recognised that participants in this project are self-selecting and therefore likely to have positive attitudes towards telehealth.

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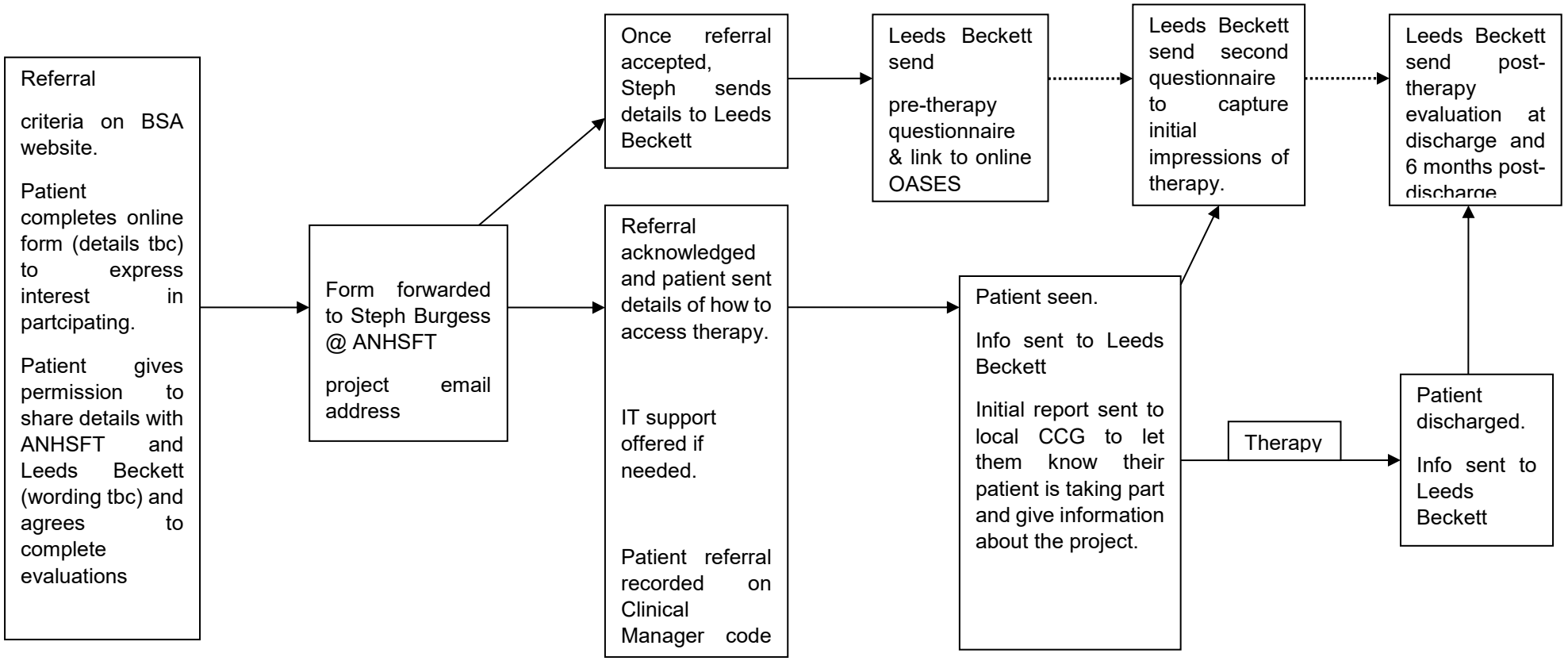
Appendix 1: Speech and Language Therapy Service, Airedale NHS Foundation Trust: Pathway for Adults who Stammer – Telemed Project



Appendix 2: Topic Guide for Interviews with Clients

1. Have you had any experience of previous face to face therapy? Can you tell me a bit about it? Can you tell me about why you have not accessed therapy locally?

2. Can you tell me a bit about your reasons for seeking therapy/ taking part in the project at this time?

3. What were your expectations from therapy (generally)/ from telemedicine?

4. The technology & related issues – what device did you use/ did it work/ any technical problems/ clarity of audio/ visual connection/ where & when did sessions take place/ any challenges with finding a space/ time

5. Were you able to build and maintain a rapport with the therapist? How did this feel?

6. What differences (if any) have you noticed since you began therapy? What aspects of therapy (generally) have been helpful/ unhelpful in making the difference? Do you think the way therapy was delivered make any difference?

7. If you've had therapy face to face before, how does this compare? Differences/ similarities?

8. Do you have any recommendations for changes for the telehealth delivery? Explain why these would be helpful?

9. What do you see as the main advantages/ disadvantages of therapy with people who stammer using telehealth? Overall, would you recommend telehealth to others? Why?