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# The Fluency Trust Residential Course for young people who stutter: A pragmatic feasibility study.

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## Abstract

**Introduction:** A feasibility study of the Fluency Trust Residential Course (FTRC) for adolescents who stutter was conducted. The study aimed to measure key areas of a feasibility trial, for example, recruitment and retention, outcome measure completion, outcome measure reliability, and acceptability of the intervention to inform future research into the FTRC.

**Methods:** Quantitative and qualitative methods were used. Participants were 23 adolescents (12-17 years), 23 parents and 2 Speech and Language Pathologists (SLPs) from the FTRC. Data collection included: outcome measure collection via a pre-test post-test quasi-experimental design (including two baseline measures), intervention fidelity checklists, semi-structured interviews with adolescents to explore acceptability of the intervention and semi-structured interviews with SLPs to explore their experiences of research participation and views on a future trial.

**Results:** Recruitment, retention and outcome measure completion levels were all 100%. Intervention fidelity was 95% and there were no adverse events. Outcome measures showed good test- re-test reliability: Progress Questionnaire Child Intraclass Correlation Coefficient (ICC)= 0.87 (95% CI= 0.69-0.94 sig<0.001) and Progress Questionnaire Parent ICC= 0.88 (95% CI= 0.70-0.95 sig<0.001). Descriptive statistics showed that group medians and means of all outcome measures shifted in a positive direction between pre and post-tests (9 weeks follow-up). Acceptability of the intervention by adolescents was high. SLPs reported participation was manageable and they were pleased to be part of the research.

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With 25% showing changes above the minimal important difference.

**Conclusion:** Quantitative and qualitative data suggest that a future definitive trial of the FTTC is indicated after additional development work and feasibility testing.

Recommendations for further research are included.

**Key words:** stutter, adolescents, group therapy, intensive, residential

## **1. Introduction**

### **1.1 Background**

Adolescence is a time of opportunity and transformation, when new experiences and learning can have powerful effects. Adolescents who stutter are more likely to avoid social situations and fear communication than their peers who do not stutter (Craig & Tran, 2006). They may also develop negative attitudes about themselves as communicators (Craig & Tran, 2006) and experience increasing social anxiety (Smith et al., 2014). Typically, interventions for adolescents who stutter have been adapted from those originally designed for children or adults, with few adaptations made for their age or stage of development. Similarly, clinical research has often failed to separate adolescents from older or younger participants. A systematic review by Baxter et al., (2016) highlighted a paucity of research into interventions for adolescents who stutter, whilst Nye et al.'s (2013) systematic review of stuttering interventions for children and adolescents concluded that although there was weak evidence to support some behavioural interventions, there were few methodologically acceptable studies. Studies frequently demonstrated inadequate reporting (e.g. no information about the number/length of intervention sessions), intervention protocol deviations, participant attrition (which was often not incorporated into the analysis), and limited follow-up times. Such limitations reduce study replicability, internal validity and external validity.

Of the few studies that met criteria for review in Nye et al.'s (2013) systematic review, just two studies involved adolescent participants (mixed with child participants). These studies related to behavioural interventions; smooth speech (delivered in either an intensive group or at home), electromyography feedback (Craig et al., 1996), and gradual increase in length and complexity of utterances (Ryan & Ryan, 1995), all of which were deemed by authors to warrant further investigation.

Just five studies involving solely adolescent participants met inclusion criteria in Baxter et al.'s (2016) systematic review. Three of these studies (Craig, Hancock, & Cobbin, 2002; Hancock & Craig, 1998, 2002) followed up participants who had received smooth speech or electromyography feedback therapy in Craig et al.'s (1996) original study and some had also received subsequent 'relapse management' therapy. Again, the fluency-related outcomes of these interventions were deemed by authors to warrant further investigation. However, Baxter et al. (2016) reported that such fluency-shaping approaches have been criticised for leading to unnatural sounding speech and that the techniques can be hard to implement in some situations.

People who stutter report interventions are more helpful and facilitate successful outcomes when they incorporate emotional/psychological/social aspects into therapy (rather than solely focusing on behavioural aspects of stuttering), and when they involve 'real-world' practice and interacting with other people who stutter (Baxter et al., 2016). Such interventions for people who stutter have several interacting components and would typically be described as complex (Craig, 2008).

The fourth study in Baxter et al.'s (2016) review investigated a complex intervention combining block modification, avoidance reduction and elements of personal construct psychology delivered within a group (Lawson, Pring, & Fawcus, 1993). Authors reported a

significant reduction in avoidance, with no change in struggle or syllables stuttered. The final study (Nilsén & Ramberg, 1999) reported on outcomes from an intensive group residential combining group therapy with drama sessions and games. The group therapy combined speech modification, developing social skills and developing ways to manage stuttering. Authors reported mixed outcomes, with some participants showing positive changes in social skills and reductions in stuttering.

Other interventions of note, which were not included in either systematic review but are highly relevant for the population in question, are the courses run at the Michael Palin Centre (UK) for young people (YP) who stutter. There is one course for YP aged 8-14 years and another for YP aged 15-18 years. These two-week intensive programmes combine social communication skills and the management of both speech and cognitive-emotional aspects of stuttering. Parents also attend a parallel two-week intensive course, and results from early studies look promising (Fry, Millard, & Botterill, 2014; Fry, Botterill, & Pring, 2009; Millard, 2011).

Most research relating to interventions for young people who stutter have largely focused on speech fluency as the primary outcome. A study into an intensive therapy program in the USA, “Camp Dream. Speak. Live” (Byrd, Hampton, McGill, & Gkalitsiou, 2016), bucked this trend reporting solely on affective and cognitive outcomes. The intervention comprised five days of intensive (non-residential) group therapy incorporating small group discussions, art, writing, dance and open-mic opportunities. It found positive outcomes for children (aged 4-14 years) relating to communication attitudes and quality of life.

There is a clear need for: interventions designed for adolescents, research into such interventions involving solely adolescent participants, and research that considers outcomes beyond speech fluency.

## **1.2 The intervention under investigation**

Given the need to provide evidence-based interventions for adolescents who stutter within the UK, a novel approach to stuttering therapy was developed by Fluency Trust Speech and Language Pathologists (SLPs) in partnership with Swindon Borough Council. The Fluency Trust Residential Course (FTRC) is a complex intervention designed specifically for YP who stutter aged 12-17 years and has evolved in response to feedback from course participants. The course aims to help YP to develop confidence in communicating, to develop flexible thinking skills, to feel more positive about speaking and to develop helpful attitudes towards speaking, to build resilience and enhance their abilities to generate solutions in challenging situations, and to develop strategies to manage stuttering (McNeil, 2013).

The five-day residential course involves a combination of outdoor activities (e.g. surfing, climbing, kayaking, team games) and group speech and language therapy. Outdoor activity courses have been used to build self-confidence, self-awareness and interpersonal relationships (McNeil, 2013). Such courses can promote self-esteem and social skills (Tucker, 2009) and provide opportunities for new learning. During the FTRC, participants are encouraged to set themselves personal challenges and to reflect upon their own skills and strengths. The outdoor activities encourage team cohesion and support the development of peer relationships amongst group members. YP are encouraged to apply their learning from the group therapy sessions to the outdoor activities e.g. using helpful thoughts, and moving out of their 'comfort zone' into their 'stretch zone' where new experiences and learning

occur. Equally, YP's learning from the outdoor activities is also applied to therapy sessions e.g. managing new challenges.

The group therapy involves a blend of interventions including communication skills development, stuttering modification (voluntary stuttering), fluency skills and strategies derived from cognitive therapies including acceptance and commitment therapy (Beilby, Byrnes, & Yaruss, 2012), cognitive behavioural therapy (Kelman & Wheeler, 2015) and solution focused brief therapy (SFBT) (de Shazer, 1985). SFBT is increasingly used with YP who stutter (Nicholas, 2015), and whilst there is preliminary evidence that it can benefit other client groups (Kim, 2008; Woods, Bond, Humphrey, Symes, & Green, 2011), there is a need for evaluation with YP who stutter.

The FTRC has been running annually since 1995 (except in 2020 due to the Covid-19 pandemic) but has not been formally researched until now. However, early evidence indicates potential positive impacts of the FTRC. For example, a case note review of the SFBT scales of YP (n=16) and parents (n=20) attending the FTRC in 2015 and 2016 showed that all participants shifted in a positive direction nine weeks post-intervention (McNeil, 2018). These scales measure YP's and parents' perceived progress (on a scale of 0-10) towards their self-identified and individualised best hopes (Berquez et al., 2015).

### 1.3 Outcome measurement in stuttering

Measuring outcomes within stuttering research is a complex issue; core outcomes have not been determined and there is ongoing debate about what constitutes a 'good' outcome (Baxter et al., 2016). Most quantitative stuttering research uses a speech-related outcome measure (for example, percentage syllables stuttered) as the primary outcome. However, there are calls for research to measure outcomes from the perspective of the person who stutters, including their perceptions of psychological change following

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interventions (Baxter et al., 2016). Furthermore, there are few standardised assessments for measuring outcomes for adolescents who stutter. Options for this age group include the Overall Assessment of the Speaker's Experience of Stuttering-Teenage (OASES-T) and the Overall Assessment of the Speaker's Experience of Stuttering- School-Age (OASES-S) which are self-reported measures designed for YP who stutter (Yaruss & Quesal, 2006). The assessments are standardised and provide a comprehensive overview of stuttering and its impact (Yaruss & Quesal, 2006). FTRC therapists have developed two outcome measures to capture YP's and parents' perceptions of cognitive change: the Progress Questionnaire Child (PQC) and Progress Questionnaire Parent (PQP). These outcomes were developed by an expert group of SLPs in conjunction with YP who stutter and their parents, thereby providing a degree of content validity. Whilst these measures specifically link to the FTRC's core aims, making them ideally placed to capture meaningful change, their reliability has not yet been established.

#### **1.4 Aims and objectives**

This paper reports on a feasibility study of the FTRC. Following UK Medical Research Council guidance for developing and evaluating complex interventions (Craig, 2008), it investigates the feasibility of undertaking a study of the FTRC, to inform a future randomised controlled trial (RCT) of the intervention. Nye et al.'s (2013) systematic review reported "clinicians have limited high-quality research to draw on in order to assess the evidentiary basis for interventions" (p.931) for children and adolescents who stutter. This study therefore considers its own strengths and limitations. It considers elements of strong trial design such as methods to increase internal and external validity of a trial and makes recommendations for future high-quality research into the FTRC.

Feasibility aims and objectives were to measure/gain information on the:



- Recruitment and retention rates (primary outcome).
- Reliability of two outcome measures, Progress Questionnaire Child (PQC) and Progress Questionnaire Parent (PQP), and their minimal important difference (i.e., the minimum difference required from pre- to post-test that would indicate the change was not due to outcome measure variability in one participant).
- Percentage of outcome measures completed, and the change and variability of outcome measures.
- Level of intervention fidelity.
- Presence of adverse events
- Acceptability of the intervention for YP and their views on taking part in the study.
- SLPs' views on taking part in the study and their views on future research into the FTRC.

## 2. Methods

### 2.1 Design

This pragmatic feasibility study employed quantitative and qualitative methods, aiming to determine the viability of conducting a future feasibility RCT. A pre-test post-test quasi-experimental one group design was employed, assessing YP and their parents before and after attending the FTRC.

### 2.2 FTRC Intervention

YP who stutter and their parents attend a pre-course assessment day three weeks before the residential course, and a follow-up day nine weeks after the course. Parents attend three, hour long group workshops, which take place on the first and last days of the residential course and the follow-up day. The five-day residential (for YP only) takes place in

the school summer holidays (in July) at an outdoor activity centre. YP complete 22.5 hours of outdoor activities such as climbing, kayaking, surfing and team challenges, led by trained staff. The specialist SLPs deliver 32.5 hours of group therapy activities to YP over the assessment, residential and follow-up days. Therapy activities are contained within an activity workbook (The Fluency Trust 2020) and comprise of a blend of interventions (see section 1.2 for the therapy approaches used). The therapy involves a mixture of activities and delivery methods including whole group discussions, small group discussions, individual activities contained within personal workbooks for each YP, practice of direct speech strategies in small groups, small group presentations, individual presentations and a questionnaire to the public about stuttering.

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### 2.3 Participants

Eligibility criteria for this study were kept broad. This made the sample as representative of clinical caseloads as possible thereby increasing external validity of the sample. Participants were those attending the FTRC in 2018 and 2019, i.e., adolescents (aged 12-17 years) who stutter and their parents. Most adolescents were identified and referred to the course by their local SLP, but some referred themselves to the course. Clinician participants were the two SLPs delivering the FTRC in 2018.

The researcher aimed to recruit all YP (n=12) and parents (n=12) attending the FTRC in 2018 (cohort 1). All YP in cohort 1 were interviewed to determine acceptability of the intervention and their views on taking part in the study. Additionally, the two SLPs delivering the intervention in 2018 were interviewed.

In order to obtain a sample size of sufficient magnitude to calculate the test re-test reliability of the outcome measures (PQC and PQP), additional YP (n=11) and parents (n=11) attending the FTRC in 2019 were recruited (cohort 2). Cohort 2 were therefore recruited

solely to determine the test re-test reliability of the outcome measures; they were not included in determining the other objectives.

## **2.4 Outcome measures**

### **2.4.1 Reliability of the PQC and PQP**

To assess test-retest reliability of the PQC and PQP (Appendix A), two baseline measurements were taken from YP (n=23) and parents (n=23) from cohorts 1 and 2. Baseline measures were collected on the initial assessment day and then 3 weeks later on the first day of the residential course.

### **2.4.2 Outcome measure change and variability**

Outcome measure data were collected to assess the feasibility of completing these outcome measures within a future study, and to measure the degree of variability to calculate minimal important difference for the PQC and PQP. The schedule of outcome measures mirrored the FTRC intervention schedule (see Table 1):

#### *Solution focused brief therapy (SFBT) scales.*

The SFBT scales measure YP's and parents' progress towards their self-identified and individualised best hopes (de Shazer, 1985). This is a self-reported scale from 0-10, where higher scores indicate the person is closer to their best hopes.

#### *Progress Questionnaire Child (PQC) and Progress Questionnaire Parent (PQP).*

As mentioned above, the PQC and PQP are self-reported questionnaires developed by the FTRC SLPs (see Appendix A). For the PQC, YP rate themselves on a 10-point scale in five areas: (1) Confidence in communicating, (2) Feelings about talking, (3) Ability to manage stuttering and feel in control, (4) Ability to solve problems, and (5) Ability to use positive thinking skills. The overall scores range from 0-50, with higher scores indicating positive

progress e.g. the young person is feeling more confident to communicate. For the PQP, parents rate their child in the same five areas.

*The Overall Assessment of the Speaker's Experience of Stuttering- Teenage/School-Age (OASES-T/S) (Yaruss & Quesal, 2006).*

The OASES-T/S are self-reported measures evaluating the overall impact of stuttering on YP. Items are rated on a 5-point scale within four sections: (1) General Information, (2) Your Reactions to Stuttering, (3) Communication in Daily Situations, and (4) Quality of Life. A Total Impact Score from 0-5 is generated by combining the information from each of the four sections, where lower scores indicate a lower adverse impact of stuttering.

Table 1: Data collection schedule for the two cohorts.

	Assessment day	First day of residential week	Last day of residential week	Follow-up day
<b>Cohort 1 YP</b>	PQC, SFBT, OASES-T/S	PQC	PQC, SFBT	PQC, SFBT, OASES-T/S interviews
<b>Cohort 1 Parents</b>	PQP, SFBT	PQP		PQP, SFBT, Written feedback
<b>SLPs</b>				Interviews
<b>Cohort 2 YP</b>	PQC	PQC		
<b>Cohort 2 Parents</b>	PQP	PQP		

Key:-

OASES-T/S: Overall Assessment of the Speaker's Experience of Stuttering-Teen/School-age.

PQC: Progress Questionnaire Child.

PQP: Progress Questionnaire Parent.

SFBT: Solution Focused Brief Therapy scale.

#### **2.4.3 The decision not to include a direct measure of stuttering frequency or severity**

Selection of appropriate outcome measures is vital for successful clinical trial design (Enderby, John, & Petheram, 2006). Establishing what is a 'good' outcome following stuttering intervention is a key challenge for the field (Baxter et al., 2016). Whilst the

majority of studies utilise measures of overt frequency or severity of stuttering as their primary outcome, this measure is ‘notoriously unreliable’ (Onslow, 2018 p.102) and clinic measures of stuttering are not necessarily representative of speakers’ typical fluency (Johnson et al., 2009). It is also debatable as to whether this measure is meaningful or the issue of most concern for people who stutter (Baxter et al., 2016). This feasibility study did not employ a direct measure of stuttering frequency/severity. The omission is justified because the FTRC does not aim to reduce stuttering, instead focusing on developing other areas such as positive thinking and communicative confidence. Additionally, consultations with YP who stutter and their parents indicated they did not feel a measure of stuttering was required or helpful in this study; measuring change in other areas such as confidence to communicate was deemed more important. One YP during a consultation about the research design stated: “It [measuring stuttering frequency/severity] kind of sends the wrong aim. In general, people who stammer always feel the pressure to be fluent and the course took that pressure away, which is really nice. So measuring stammering makes it feel like you’ve only been successful if you’re stammering less, which isn’t the case. And also I think I’d feel really awkward speaking because I’d be like ‘oh no they’re going to count my stammer’ – it feels a little bit awkward.” One parent during a consultation about the research design stated: “If you start measuring their stammering, you’re telling them that their stammer is a problem – don’t do it [measure stuttering frequency/severity]!”

## **2.5 Intervention fidelity**

Intervention fidelity checklists were developed by the researcher from the planned course content. They included a list of all activities to be delivered within each therapy session. For example, one session consisted of the following activities with corresponding

Fluency Trust workbook page numbers (The Fluency Trust 2020): Basic information about stuttering (p.10-11), discussion about the “iceberg” analogy of stuttering (Sheehan 1970) and YP completing an iceberg related to their own stuttering, plus strategies that help them (p.13), mechanics of talking- what we use to speak (p.17), introduction to soft contacts and small group practice (p.25), SLP reads “demons on the boat” acceptance and commitment therapy passage (Harris 2007).

The SLPs delivering the intervention completed fidelity checklists at the end of each therapy session, marking whether each therapy activity had been completed. Additionally, the researcher completed fidelity checklists following *in vivo* observations of 100% of the group therapy for YP and 33% of the group sessions for parents.

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## **2.6 The acceptability of the intervention to young people and their views on taking part in the study**

The views of YP (n=12, cohort 1) were audio-recorded during individual semi-structured interviews with the researcher on the post-course follow-up day. These interviews took place at the Saltway Centre in Swindon, UK. Participants who were unable to attend the follow-up day completed phone or Skype interviews. Interviews were guided by an interview schedule. Interview topics aimed to explore acceptability of the course and participants’ views on taking part in the research. Interview questions related to therapy content (likes and dislikes), the amount of therapy, the length of the course, and their views on the outdoor activities and outcome measure completion (including frequency and the time taken to complete them). There were also questions about whether participants had implemented any of their learning from the residential in their everyday lives after the course, if they would recommend the course to other YP who stutter and why, and how they would describe the course. Follow-up prompts were used when necessary to further explore YP’s views.

## 2.7 Speech and Language Pathologists' views on taking part in the study, and views on future research into the FTRC

SLPs' experiences of taking part in the research and their views on future research relating to the FTRC were obtained via face-to-face semi-structured interviews. These interviews took place at the Saltway Centre in Swindon, UK on the post-course follow-up day. Interview topics aimed to explore SLP's views on taking part in the research. This included their thoughts on the organisation of outcome measure collection and their views on completing the fidelity checklists. Their views on future research into the FTRC were also explored.

## 2.8 Data analysis

Statistical analysis and inference is not warranted within feasibility studies (Young & Young, 2005). This study was not fully powered and did not employ a control group, so inferences could not be drawn from the sample to the population. As per recommendations for feasibility studies, descriptive statistics were used (Tickle-Degnen, 2013). Percentages and n-values were reported where appropriate (e.g. to report recruitment, retention, and outcome measure completion), and changes in outcome measures were summarised alongside effect sizes.

Test-retest reliability of the PQC and PQP was explored via calculating intraclass correlation coefficients (ICC), creating Bland-Altman plots and determining the minimal important difference. It is assumed each item in the questionnaires contain approximately the same proportion of information about the construct being measured, and contribute equally to the total scale score. The ICC is a measure of agreement between two (or more) quantitative measurements. The closer the ICC is to 1.0 the greater the test-retest reliability. The form of ICC selected was: The two-way mixed effects, consistency, single rater/measurement according to the McGraw and Wong (1996) convention, or the ICC (3,1) according to the Shrout and Fleiss (1979) convention.

The minimal important difference (MD) was defined as:

$$MD = SEM \times 1.96 \times \sqrt{2}$$

Where SEM is the Standard Error of Measurement (SEM) defined as

$$SEM = SD \times \sqrt{1 - ICC}$$

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Where ICC = reliability coefficient and SD = standard deviation of scores from all subjects, Weir (2005).

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Qualitative data from semi-structured interviews with YP and SLPs were analysed using inductive thematic analysis (Braun & Clarke, 2013). Further details of the qualitative data analysis are given in the companion paper.

## 2.9 Ethics

The research received ethical approval from the NHS Health Research Authority (South West - Central Bristol Research Ethics Committee [REC], REC reference 18/SW/0013, Integrated Research Application System [IRAS] project ID 239295), Plymouth University (reference 17/18-383) and Swindon Borough Council.

## 3. Results and Discussion

Due to the high number of aims and to increase ease of reading, the results and discussion are reported jointly. They are presented here in the order of the study aims.

### 3.1 Recruitment and retention

Twelve YP (100%) and twelve parents (100%) were eligible and recruited to the study (cohort 1). The mean age of YP was 14 years, 10 months (range 12:6 - 17:1), 25% (n=3) were female and 75% were male (n=9). Two SLPs (100%) were eligible and recruited. All eligible participants consented to take part, and no-one withdrew over the lifetime of the study from recruitment to final data collection.

The very high recruitment and retention rates indicated participants' willingness to take part in research and that the research burden was appropriate. This suggests recruitment and retention in a future trial may be high, however, a different design (e.g. a



RCT) may affect recruitment and retention. Recruitment rates may be different in community clinics and participants may be unwilling to be randomised.

The broad eligibility criteria for this study increased inclusivity and made the sample as representative of clinical caseloads as possible, enhancing external validity of the sample (Greenhalgh, 2014). To increase this external validity further, collection of additional background information in future studies of the FTRC would be helpful e.g. age at stuttering onset, previous therapy received and additional diagnoses that may impact upon participation and engagement on the course (e.g. Autism Spectrum Condition, Attention Deficit Hyperactivity Disorder). This information would help clinicians determine if the results can be applied to their caseload (Greenhalgh, 2014).

### 3.2 Outcome measures

#### 3.2.1 Test re-test reliability for the PQC and PQP and minimum difference considered to be real

To calculate the test-retest reliability, a total of 23 participants (cohorts 1 and 2, recruited from the 2018 and 2019 courses respectively) allowed the detection of a correlation coefficient of 0.57 (power=0.85,  $\alpha=0.05$ ). Outcome measures were taken three weeks apart - Trial 1 measures were taken at the initial assessment day, Trial 2 measures were taken on the first day of the residential course. Koo and Li (2016) state that intraclass correlation coefficient (ICC) values “less than 0.5 are indicative of poor reliability, values between 0.5 and 0.75 indicate moderate reliability, values between 0.75 and 0.9 indicate good reliability, and values greater than 0.90 indicate excellent reliability” (p.161). The ICC for the PQC was 0.87 (95% CI=0.69-0.94 sig<0.001) and for the PQP it was 0.88 (95% CI=0.70-0.95 sig<0.001), indicating good levels of test re-test reliability (Koo and Li 2016).

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Figures 1 and 2 show the Bland-Altman plots for both outcome measures. The Bland-Altman allows a visual interpretation of the data, as follows. There was a slight increase in the scores between trial 1 (outcomes obtained at the initial assessment day) and 2 (outcomes obtained on the first day of the residential course) for both measures; PQC scores increased by 0.37 and PQP scores increased by 2.30. There appears no systematic bias associated with the size of the mean score for either outcome measure, i.e. lower scores and higher scores were associated with similar differences between trial 1 and trial 2. For the PQC, 91% of data points fell within  $\pm 2SD$ . For the PQP, most data points clustered relatively centrally, and all data points fell within  $\pm 2SD$ , indicating there were no major outliers.

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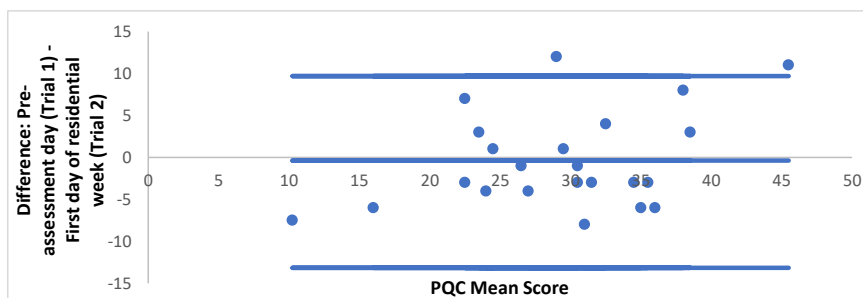


Figure 1: Bland-Altman plot for the Progress Questionnaire Child (PQC).

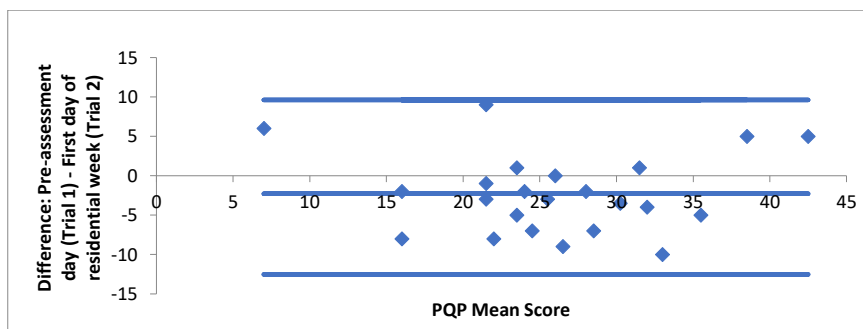


Figure 2: Bland-Altman plot for the Progress Questionnaire Parent (PQP).

The minimum difference considered to be real (e.g. not due to outcome measure variability) for the PQC and PQP were calculated. On the PQC, a minimum difference of 11.74 points is required between pre-intervention and post-intervention individual scores to be certain the change is not solely due to the variability of the measure. For the PQP, the minimum difference is 11.27.

When combined with the Bland-Altman plots, the intraclass correlation coefficient levels indicate good reliability of the PQC and PQP, suggesting these measures are reliable for use in future trials. The slight increase in scores between trial 1 and trial 2 for both measures may indicate a small practice effect. During the assessment day YP and parents meet SLPs and other YP who stutter/ parents of YP who stutter, which may have a positive influence. Also, the assessment day involves SFBT questioning and experiences that potentially begin the process of change. Future research of the FTRC should take baseline measurements prior to the assessment day.

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### **3.2.2 Outcome measure completion**

There was 100% compliance with outcome measure completion. Such high completion levels corroborated with YP's qualitative comments that the frequency of outcome measure completion was largely acceptable. Those who did not attend the post-course assessment day completed their post-course outcome measures and interviews with the researcher via phone/Skype or at the Saltway Centre on a different day.

### 3.2.3 OASES

The OASES total impact score has a range of 0 to 5 where lower scores indicate less negative impact. The median OASES total impact score changed by -0.60 and the mean changed by -0.47 over the course (Table 2), with a large effect size of  $d=-0.8$  (Walker, 2007).

Table 2: OASES Total Impact Score.

	Assessment day	Follow-up assessment day	Change between initial assessment and follow-up day
Median	2.80	2.20	-0.60
IQR	0.83	0.78	
Mean	2.69	2.22	-0.47
SD	0.59	0.47	
Range	1.65 - 3.75	1.45 - 3.08	
Impact Rating	Moderate	Mild-Moderate	

### 3.2.4 PQC

The PQC has a range of 0 to 50 where higher scores are positive, e.g. increased confidence to communicate. The median PQC changed by +8.5 and the mean changed by +10.1 over the course (Table 3), with a large effect size of  $d=1.1$  (Walker, 2007). Three participants (25%) had a change in scores above the minimum difference (+11.74).

Table 3: Progress Questionnaire Child.

	Assessment day	First day of residential	Last day of residential	Follow-up assessment day	Change between initial assessment and follow-up day
Median	28.5	33.5	35.5	37.0	+8.5
IQR	7.8	12.3	7.3	7.5	
Mean	28.5	30.2	35.9	38.6	+10.1
SD	9.1	8.1	5.1	4.6	
Range	6.5 - 42.0	14.0 - 39.0	28.0 - 45.0	32.0 - 46.0	

### 3.2.5 PQP

The PQP has a range of 0 to 50 where higher scores are positive, e.g. their child has increased confidence to communicate. The median PQP changed by +14.0 and the mean

changed by +14.4 over the course (Table 4), with a large effect size of  $d=1.7$  (Walker, 2007).

Nine participants (75%) had a change in scores above the minimum difference (+11.27).

Table 4: Progress Questionnaire Parent.

	Assessment day	First day of residential week	Follow-up assessment day	Change between assessment day and follow-up day
<b>Median</b>	25.0	27.5	39.0	+14.0
<b>IQR</b>	7.5	9.5	6.0	
<b>Mean</b>	24.8	26.9	39.2	+14.4
<b>SD</b>	8.3	9.6	4.1	
<b>Range</b>	10.0 - 45.0	4.0 - 40.0	33.8 - 48.0	

### 3.2.6 Solution focused brief therapy (SFBT) scales

The SFBT scale has a range from 0 to 10, where higher scores indicate the participant is closer to their best hopes (best hopes achieved = 10). The median/mean SFBT scale scores showed positive change for both YP and parents (Tables 5 and 6). The effect sizes were considered to be large (Walker, 2007):  $d=2.3$  for YP, and  $d=2.9$  for parents.

Table 5: Solution focused brief therapy scales for young people.

	Assessment day	Last day of residential week	Follow-up assessment day	Change between assessment day and follow-up day
<b>Median</b>	4.8	7.0	8.0	+3.2
<b>IQR</b>	1.8	1.3	1.8	
<b>Mean</b>	4.9	7.3	7.9	+3.0
<b>SD</b>	1.3	0.9	1.2	
<b>Range</b>	2.5 - 7.0	6.0 - 9.0	5.0 - 9.7	

Table 6: Solution focused brief therapy scales for parents.

	Assessment day	Follow up assessment day	Change between assessment day and follow-up day
<b>Median</b>	4.8	8.8	+4.0
<b>IQR</b>	2.1	1.5	
<b>Mean</b>	4.5	8.3	+3.8
<b>SD</b>	1.3	1.3	
<b>Range</b>	2.0 - 6.5	5.0 - 10.0	

As a feasibility study, the objective was not to estimate treatment efficacy, but to consider key study parameters to inform a future study. However, the effect sizes reported provide an indication of a signal of efficacy. The results from this study indicate the FTRC warrants further investigation: descriptive data analysis indicated that group median and mean scores for all outcome measures shifted in a positive direction post-intervention. Additionally, some participants exhibited changes above the minimum difference for both the PQC and PQP (25% and 75% respectively).

### 3.3 Intervention fidelity

SLPs were 100% compliant, completing all of the fidelity checklists. They found the fidelity checklists quick and easy to use. However, they completed the daily checklist together on three days (rather than independently, as planned) and completed them independently on two days. A joint checklist is advised for future trials to save on time, plus scheduled *in vivo* observations by the researcher.

Intervention fidelity was 95%; 158 out of 167 activities were delivered as per schedule. The overall percentage was reduced due to omissions from the planned schedule. If additional activities were added, this was not deducted from the overall percentage.

The high level of intervention fidelity enhanced the study's internal validity and replicability. It suggests the intervention could be delivered with a high degree of consistency in multiple settings during a future multi-centre trial.

### 3.4 Adverse events

No adverse events occurred during the FTRC or research process. It is important that interventions and research procedures are as safe as possible for participants. Although there was a level of risk associated with outdoor activities, this was mitigated by the outdoor activity centre ensuring appropriate training of staff and implementing adequate

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<https://www.nihr.ac.uk/documents/is-an-intervention-ready-for-hta-evaluation/22003#:~:text=HTA%20research%20is%20undertaken%20when,in%20a%20primary%20outcome%20measure.>

health and safety procedures. Future trials should ensure a high standard of health and safety and that all staff are appropriately trained.

### **3.5 Acceptability of the intervention for young people**

Acceptability and satisfaction with interventions is not often evaluated within stuttering research (Johnson et al., 2016), yet a key purpose of a feasibility study is to consider these factors (Feeley et al., 2009). Acceptability of the FTRC appeared high for most participants; all YP reported they had employed strategies from the FTRC (e.g. cognitive strategies such as changes in thinking, or direct speech strategies) in real-life situations following the course. For example, one YP said, “The things that I’ve kind of taken away are the confidence and the problem-solving and the positive thinking from the course” (txdh/218-221), and another commented, “I’ve been using the slide [easy onset], so where I just uh... you just slowly start and you just glide into it kind of... so I don’t really realise I’m using it... I only realise after I’ve done it and I think that was a really good use of it” (psqh/285-289).

Maintaining naturalness of speech is important and research suggests some YP may feel self-conscious using speech strategies when talking with their peers (Hearne *et al.*, 2008). The numerous strategies (cognitive and direct) presented within the FTRC allowed YP to choose strategies that most suited them. For example, one YP said, “It was good that we did have a large variety of things that they taught us and it was good that we had like our own choice on what skills we kind of used” (txdh/250-253). Some participants reported choosing to use only cognitive strategies. For those using direct speech strategies, YP made individual choices about suitability. For example, some reported they preferred soft contacts whilst others reported they used easy onsets the most.

Overall, it appeared that all YP had positive experiences on the course, and that the course was helpful. When asked “how you would describe the course?” YP said:

- “I would describe it as an opportunity for young people who don’t find life very easy to kind of like improve their mental wellbeing and make their life like generally better” (txdh/372-375).
- “I would say it’s a good confidence builder, it’s good to meet new people that you wouldn’t usually talk to, it’s good to have people that are in the same position as you to help you and make you move forward as a person” (xqxp/305-309)
- “A life changing experience” (s87i/424).

In line with the literature (Hearne, 2008; Jenkins, 2016), group therapy was well-liked. Most YP reported they enjoyed the group sessions, reporting they were able to support each other, hear each other’s views, and learn from each other. For example, one YP said, “Made me feel pretty good to express our opinions to each other an’ learn new things off each other” (kdi4/458-460). However, one participant expressed a desire for increased small group and paired activities, which is a consideration for FTRC SLPs.

Many YP found the therapy to be interactive and engaging, though others felt some therapy activities were less motivating and found it hard to maintain focus. Many expressed a preference for the practical therapy activities, e.g. the questionnaire to the public, presentations, and speech technique practice in small groups. Such practical activities were regarded as the most helpful and enjoyable. They also reportedly supported YP to transfer their skills into real-world situations, which is a challenge in stuttering therapy (Stewart & Richardson, 2004). Some FTRC participants expressed the desire for more practical therapy activities, which is a consideration for FTRC SLPs.



There were mixed views on the amount of time spent on therapy activities- it was right for some, but too much for others. Most felt there was a lot of time spent in therapy, however, they also felt that the therapy was helpful, engaging, necessary and allowed YP to embed their learning.

Six YP thought the course was a good length (five days). Six YP would have liked the course to be longer. No one thought it should be shorter than five days.

All YP stated they would recommend the FTRC to other YP who stutter. One young person would recommend it for the outdoor activities and the experience, rather than the therapy, and indicated that their reduced attention and listening skills may have been an influencing factor in this view. Collecting information about additional diagnoses would enable exploration of individual responsiveness to therapy.

Half of the YP would not change anything about the course. Others suggested small changes to the course, e.g. more practical activities in the therapy, a reduction in therapy hours, access to WiFi, and a later bedtime.

### **3.6 Young people's views on research participation**

Whilst one YP expressed some frustration at the repetition of content within the outcome measures, others' comments indicated the outcome measure content was acceptable. All but one of the YP felt the frequency of outcome measure completion and time taken to complete outcome measures was acceptable (one YP thought it was high). When combined with the 100% completion rate, this indicates the burden was not too high, and the outcome measure schedule was largely acceptable.

### **3.7 SLPs' views on research participation and views on future research into the FTRC**

SLPs were pleased the research was happening and discussed benefits of further research into the FTRC. Whilst one SLP acknowledged there was a high amount of organisation involved in the run up to the study, both felt the participant burden during the study was manageable e.g. completion of fidelity checks and outcome measures.

Both SLPs felt further research into the FTRC would be beneficial for many reasons may help increase funding for the FTRC.

Both SLPs were confident that the FTRC could be delivered at more activity centres around the country. More courses would improve access for YP who stutter in different geographical locations. Future research should consider what is required to train additional SLPs to deliver the FTRC and how to retain the fidelity of the intervention in new activity centres.

One SLP discussed the need to further explore which elements of the FTRC make the difference for participants. Indeed, a key part of evaluating complex interventions is to determine how the intervention works, identifying the active ingredients and how they exert their effect (Craig, 2008). The UK Medical Research Council's model for developing and evaluating complex interventions advises research at numerous phases including:

- Development (e.g. identifying the evidence base, developing theory, and modelling processes and outcomes).
- Feasibility/piloting (e.g. testing procedures, estimating recruitment/retention, and determining sample size).
- Evaluation (e.g. assessing effectiveness, understanding the change process and assessing cost effectiveness).

- Implementation (e.g. dissemination, surveillance and monitoring, and long term follow-up).

It is acknowledged that the phases of evaluation within the Medical Research Council's model may not follow a linear or cyclical sequence (Campbell et al., 2007). Whilst this study was positioned within the 'feasibility' phase of this model, there is a need to complete further work at the 'development' phase of the model. This could, in part, be addressed through further qualitative research to explore which elements make the difference for participants (see companion paper for further discussion).

One SLP discussed the excess intervention costs of the FTRC e.g. residential and outdoor activity elements. Therefore, finding out if the course is time and cost-effective would be helpful. Establishing the feasibility of collecting resource data that will be required for a future health economic analysis is warranted.

SLPs discussed that outcome measures should link with the aims of the intervention. It is important the outcome measures used to evaluate the FTRC fit with the ethos of the course. The PQC and PQP were designed by FTRC therapists to specifically fit the course aims. Therefore, further testing of the psychometric properties of these measures (e.g. responsiveness) is recommended.

The addition of the Therapy Outcome Measure (TOM) (Enderby et al., 2006) into future studies of the FTRC was discussed by SLPs. The TOM is designed to be a holistic measure, based on the World Health Organisation's International Classification of Functioning, Disability and Health framework. The TOM is the UK Royal College of Speech and Language Therapists' preferred outcome measure for speech, language and communication needs. This may increase the likelihood that UK SLP services and researchers

will adopt this measure, enabling comparisons of outcomes following different interventions.

### 3.8 Limitations

Prior to this study, there was no information available about the psychometric properties of the PQC and PQP. This study only addressed the test-retest reliability of these outcome measures. Future research should seek to investigate additional psychometric properties such as face validity, in line with guidelines on the COSMIN checklist (Mokkink et al 2021).

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The use of convenience sampling within this study was a limitation, and in-depth background information about participants was not collected. The final data collection occurred on, or soon after, the follow up assessment day. Further studies could investigate longer term impacts of the course by, for example, conducting additional outcome measures 12-months post-course. Some interviews with YP were conducted face-to-face at the Saltway Centre, whereas others were conducted on the phone or via Skype. These varying locations and methods potentially reduced internal validity. Furthermore, some people who stutter may find talking on the phone challenging (Yaruss & Quesal, 2004), thereby reducing their ability to fully express their views. Whilst face-to-face interviews may be preferable (Braun & Clarke, 2013), virtual interviews offered a pragmatic solution especially where participants were geographically dispersed. Whilst SLPs engaged in the member-checking process of their qualitative data, no YP responded to requests to member-check. Future patient and public involvement should explore what factors would enable YP to engage with this process, to ensure their views are accurately captured and reduce any possible misrepresentation of views.

### 4. Conclusion

Positive outcomes from this feasibility study indicate further evaluation of the FTRC is both warranted and feasible. Although it was certainly not a definitive study, qualitative data from interviews and quantitative pre- and post-outcome measure data provided an initial “signal of efficacy”. The data suggest that a future definitive trial of the FTRC may be indicated after additional development work and some further feasibility testing (Craig 2008). A future feasibility RCT of the FTRC versus ‘usual intervention’ may then be recommended.

**Conflict of interest**

The authors report no conflicts of interest.

**Acknowledgements**

See file uploaded separately to maintain anonymity.

## Appendix A

### COURSE PROGRESS QUESTIONNAIRE CHILD

Name: \_\_\_\_\_ D.O.B.: \_\_\_\_\_ Date completed: \_\_\_\_\_

#### Young Person

The aims of the course are:

1. To gain confidence in communicating.
2. To feel more positive about speaking & less bothered about stammering.
3. To be able to manage stammering and increase the feeling of fluency control.
4. To develop problem solving and self-help skills.
5. To develop positive thinking skills.

Please complete the following scales by indicating where you are now on the scales with an X.

1. Confidence in communicating.

0 1 2 3 4 5 6 7 8 9 10



Never confident



Very confident

2. Feelings about talking.

0 1 2 3 4 5 6 7 8 9 10



Feel negative about talking  
Very bothered by stammering



Feel positive about talking  
Not bothered about stammering

3. Ability to manage stammering and feel in control.

0 1 2 3 4 5 6 7 8 9 10



Never manage stammering  
No feeling of control



Able to manage stammering well  
Feel in control

4. Able to solve problems.

0 1 2 3 4 5 6 7 8 9 10



Cannot solve problems that occur



Able to solve problems

5. Ability to use positive thinking skills.

0 1 2 3 4 5 6 7 8 9 10



Unable to think positively  
Lots of junk thoughts



Able to think positively  
Able to change junk thoughts  
into cool thoughts

Total score: \_\_\_\_\_

**Post Course:** Please state 10 words that describe what you think/ feel about the Fluency Trust Course

**Please make any further comments:**

### **COURSE PROGRESS QUESTIONNAIRE PARENT**

Name: \_\_\_\_\_ D.O.B.: \_\_\_\_\_ Date completed: \_\_\_\_\_

#### **Parent**

The aims of the course are:

1. To gain confidence in communicating.
2. To feel more positive about speaking & less bothered about stammering.
3. To be able to manage stammering and increase the feeling of fluency control.
4. To develop problem solving and self-help skills.
5. To develop positive thinking skills.

Please complete the following scales by indicating where your son/daughter is now on the scales with an X.

1. Confidence in communicating.

0 1 2 3 4 5 6 7 8 9 10



Never confident



Very confident

2. Feelings about talking.

0 1 2 3 4 5 6 7 8 9 10



Feel negative about talking  
Very bothered by stammering



Feel positive about talking  
Not bothered about stammering

3. Ability to manage stammering and feel in control.

0 1 2 3 4 5 6 7 8 9 10



Never manage stammering  
No feeling of control



Able to manage stammering well  
Feel in control

4. Able to solve problems.

0 1 2 3 4 5 6 7 8 9 10



Cannot solve problems that occur



Able to solve problems

5. Ability to use positive thinking skills.

0 1 2 3 4 5 6 7 8 9 10



Unable to think positively  
Lots of junk thoughts  
into cool thoughts



Able to think positively  
Able to change junk thoughts

Total score: \_\_\_\_\_

**Post Course:** Please state 10 words that describe what you think/ feel about the Fluency Trust Course

**Please make any further comments:**

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