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Abstract:

Objective: This pilot study sought to determine whether adolescent and adult patients benefit from weekly cleft-specific Speech Language Therapy (SLT) services, and to understand how concurrent psychology clinic services influence patient-reported outcomes.

Methods: Twelve patients (12y+) with cleft-related speech concerns were seen at the University of Canterbury Speech and Psychology clinics in 2023. Patients elected to receive SLT and psychology services in-person, online, or a combination of both. Patient-reported outcome measures of speech function, intelligibility and acceptability, speech distress, psychological and social function were completed before therapy, midway, immediately post, and three-months post their 4-8 week block of treatment. Quantitative data were analysed using descriptive statistics. Patients and clinicians completed exit interviews to understand their clinic experience. Interviews were analysed using conventional content analysis.

Results: Participants reported improved speech function, intelligibility and acceptability following the clinic. Participants also conveyed improvements in speech distress, psychological and social function, which peaked after receiving psychology services. Patient exit interviews suggested positive clinic experiences and that the intensity saw improvements realised in a short timeframe. Facilitators and barriers to the clinic's success were identified. Clinicians gained confidence working with patients with CL/P and valued the cross-discipline working opportunity.

Conclusions: Cleft-specific SLT services and routine psychological care should be available across the lifespan, and with regular frequency. Accessibility options enhanced engagement with the clinic. Regular multidisciplinary working between SLTs and psychologists facilitates clinical success, and university clinics can provide a valuable adjunct to hospital CL/P services. Ongoing clinical training opportunities such as collaborative clinics to gain experience working with CL/P are warranted.

Background

A diagnosis of cleft lip and/or palate (CL/P) commonly results in speech concerns, with many patients requiring Speech Language Therapy (SLT) services.[1-5] These concerns often include issues of speech sound development, and disorders of resonance and are present from an early age.[6] Left unaddressed, speech concerns can impact negatively on a person's well-being[7-9] and on their social and vocational choices and opportunities.[10-11]

Unmet SLT needs

In New Zealand, CL/P services are provided through multidisciplinary cleft teams, funded by the public health service.[12] A recent audit study highlighted that cleft-related SLT provision was insufficient and unable to adequately address the clinical needs of all patients.[1] The cleft team SLT may therefore conduct an assessment and then refer to generalist SLT services for intervention; most commonly the Ministry of Education.[5] Currently, SLT services generally have greater availability for younger patients, with adolescents and adults being less likely to be seen by either the hospital cleft team or Ministry of Education.[1]

In a recent New Zealand study, cleft team clinicians reported considerable unmet SLT needs in the adolescent CL/P population, particularly around the age of transitioning from childhood to adulthood[13], a sentiment echoed by caregivers who identified poor speech outcomes as their most prevalent concern.[14-15] Furthermore, a contemporary study of New Zealand adults with CL/P found that approximately half of the participants in the study would choose to access further SLT services if they were available to them.[11]

Although long-term SLT outcome data for CL/P is scarce, there are cohort data for SLT outcomes for children with CL/P in New Zealand (NZ).[1] This audit study found that over 80% of children with CL/P had issues with intelligibility at age 5, with speech in almost 40% of the cohort deemed to be unintelligible or minimally intelligible. This compares to reports of intelligible speech within the normal range in 50-80% of 5-year-olds with CL/P in the UK and Scandinavia .[16-19] Even at age 10, over 20% of the New Zealand cohort had persistent intelligibility concerns, and almost 60% had

concerns about speech acceptability.[1] The outcomes from this audit study demonstrate that cleft-related speech outcomes in NZ are poorer for longer than in several other high income countries. Given the high prevalence of concerns persisting at age 10 and the lack of ongoing access to SLT services, it follows that speech concerns can persist well into adolescence and adulthood.[11]

Psychological Impact of Speech Concerns

Research aimed at understanding the holistic impact of cleft-related speech concerns has increased in recent years. A study of Canadian adolescents and adults found that people born with CL/P had considerably more apprehension when participating in group discussions, meetings, public speaking, and interpersonal communication than non- cleft-affected controls.[20] The findings indicate that people with CL/P sometimes avoid certain scenarios where oral communication is required. This can include the workplace potentially limiting employment prospects.[11,21-22] Prior studies in NZ and the UK further found that psychological concerns about cleft-related speech differences can persist into adulthood, potentially resulting in lower self-esteem, and limited social and vocational opportunities.[11,14,22] Additional research has found that psychological concerns regarding speech differences can persist even when people have had previous access to speech language therapy services,[11,22] indicating that SLT services alone may not fully address speech concerns.

Despite being commonplace in some countries[3-4], routine access to Clinical Psychology is not ubiquitous on cleft teams globally.[11,13,23] Presently, only one unit in NZ has a Clinical Psychologist, with capacity to see only those with the most pressing need as identified through their own internally-developed screening tool.[13] People with CL/P in New Zealand who wish to access cleft-related psychological services face similar barriers as those wishing to access SLT services. A CL/P team or a general practitioner may be able to refer to a counselling or psychology service, however these typically specialise in short-term intervention and are unlikely to have specialist knowledge of CL/P, craniofacial and/or speech-related psychological concerns.

The ongoing need for cleft-specialist clinical psychology services in adulthood is well documented globally.[21,23-25] CL/P parameters of care developed by the American Cleft Palate-Craniofacial Association (ACPA) acknowledge that patients and their families require regular assessment of their

psychosocial needs.[3] The parameters state that this assessment should be completed by a psychologist who is familiar with craniofacial conditions and related speech and hearing concerns, using standardised psychological assessments alongside psychosocial screening interviews.[3] Finally, the guidelines outline the role of psychological services throughout the treatment journey from birth to adulthood. The National Health Service (NHS) and European Committee for Standardisation (CEN) cleft service specifications[4,26] similarly outline the importance of clinical psychologists throughout the lifespan. Despite international recognition of the need for psychology services, many locations, including NZ do not yet have resourcing to provide routine psychological care.

Establishing a pilot hybrid clinic

Considering the prevalence of ongoing cleft-related speech concerns, and insufficient SLT service provision for CL/P in NZ, this study sought to investigate the effect of providing weekly SLT to adolescents and adults with cleft-related speech concerns to assess whether this more intensive therapy input leads to improvements in speech outcomes. Furthermore, given the known impact of persistent psychological concerns arising from cleft-related speech differences, speech language therapists and psychologists working in tandem may result in improved holistic quality of life measures related to speech concerns. This will be tested by comparing the outcomes of those who receive intensive SLT services before receiving psychology with those who receive SLT and psychology services concurrently.

Aims and Hypotheses

This feasibility study sought to answer three research questions by trialling a new model of service delivery offering Clinical Psychology alongside routine SLT care for adolescents and adults:

1) Do adolescents and adults demonstrate gains in self-reported speech function, intelligibility, and acceptability following a block of weekly intensity cleft-specific SLT services?
2) To what extent does adding routine psychology services alongside SLT services influence patient reported outcomes of speech distress, psychological function, and social function?
3) What are the facilitators and barriers of a University-based CL/P clinic which offers SLT and clinical psychology services as reported by patients and clinicians?

Based on existing literature, the following hypotheses are made:

- The provision of cleft-specific SLT services will result in self-reported improvements in speech function, intelligibility, and acceptability, and satisfaction with speech outcomes.
- The provision of clinical psychology services will result in self-reported improvements in speech distress, psychological function, and social function.
- People who access concurrent SLT and clinical psychology services will score more favourably on measures of speech distress, psychological function, and social function at the end of their SLT treatment block, compared with those who access psychology after SLT. Maximal gains in these measures will be achieved once psychology intervention is complete.
- Student clinicians will qualitatively report increased confidence in working with individuals with CL/P following their placement and will have developed a greater understanding of the role of the other discipline.

Methods

Clinic Design

A CL/P clinic was established within a University clinic where SLT and Clinical Psychology students are trained by qualified and registered clinicians. The clinic was designed in collaboration between University of Canterbury, Christchurch Hospital and a UK CL/P Team Psychologist and was funded by University of Canterbury. The clinic was available from February-October 2023. Patient participants needed to reside in New Zealand and could choose to attend the clinic in-person or via telehealth.

When designing this study in consultation with Christchurch Hospital, the University's ability to see some of these patients was viewed as a major drawcard of the study, with CL/P team clinicians

explaining that they would be unlikely to be able to see these patients despite clear clinical need (Christchurch Hospital Cleft Service, face-to-face meeting, August 24, 2022).

Based on recent evidence which has found that SLT services delivered by telehealth can be as effective as in-person appointments,[27] services were offered both in-person and remotely to reduce access inequities. The clinic has extensive experience and facilities to provide telehealth services which would enable equitable access and reduce rural inequities.

Patient participants were allocated to one of two groups. Group A received SLT services for a block of therapy followed by Clinical Psychology services for a block of therapy. Group B received both SLT and clinical psychology services concurrently. There is strong evidence from systematic reviews of children,[27] adolescents and adults[28] with speech sound disorders that frequent speech language therapy leads to faster gains and greater generalisation of skills. The Royal College of Speech Language Therapy Clinical Guidelines[2] and American Speech and Hearing Association Clinical Parameters[29] both recommend greater frequency of sessions to achieve stronger therapeutic gains. Therefore, weekly sessions were provided within this clinic for both services. All services were available to patient participants free of charge. Patients were either referred by their CL/P team, a community SLT, or completed a self-referral. If patients self-referred, their CL/P team was advised of their participation in the clinic.

An SLT assessment protocol and CL/P clinic-specific case history form were developed for use in this clinic based on the University's existing SLT clinic documentation. The SLT intervention offered during the clinic was determined by the treating team and based on the assessment findings. Through discussion between the University psychology team and the UK CL/P team advisor Clinical Psychologist, it was agreed that Cognitive Behavioural Therapy and/or Acceptance and Commitment Therapy would be the treatment models used within this clinic, in alignment with international CL/P psychology practices. The choice of psychology intervention was determined by the treating team based on assessment findings.

Student clinicians from both disciplines were provided with thorough CL/P specific training before working within the clinic. The training included an overview of CL/P, common issues and stigmas, existing treatment pathways, and common speech and psychological concerns for the CL/P population based on the literature. The training also covered the study protocol, the running of the clinic and the internal and external support and supervision available. A training pack with relevant readings and resources was provided to each student and staff clinician.

In addition to the initial training, cross-discipline case review sessions were offered fortnightly. These provided an opportunity for staff and students from both disciplines to come together and review progress for their shared patients. These sessions were in addition to regular individual supervision that students would receive from their Clinical Educator.

The clinic was advertised within CL/P teams, on the University website and via e-newsletters from Cleft New Zealand. All assessment and therapy sessions were conducted by staff clinicians, or student clinicians under direct supervision of staff clinicians.

To explore feasibility of this hybrid clinic approach, the planned sample size reflects pilot data to guide further investigations, once feasibility and refining of delivery is established through this preliminary study.

Ethics and Licencing

The University of Canterbury Human Research Ethics Committee (HREC) approved this study in January 2023. Written informed consent was obtained from all patient, staff, and student participants. In the case where a patient participant was aged under 18 years, written informed consent to participate in this study was provided by the participants' legal guardians/next of kin. A licence to use the CLEFT-Q patient outcome measures[30] for this research was issued by McMaster University, Canada.

Participants

Eligible patient participants included individuals aged 12+ years (including adults) who had a cleft-

related speech concern which they wished to address. Participants had to confirm a preparedness to engage with clinical psychology services as part of their treatment at the clinic.

Participants entering the clinic were given a participant code which they would use consistently for submitting their outcome measure data in the study. They were then randomly assigned to Group A or B using Team Picker Wheel[31]; a parameter was set to ensure equal distribution into the two groups.

Eligible student clinician participants were students who were selected by their clinical education programme to be enrolled in the CL/P clinic. These students were required to see patients within the CL/P clinic as part of their clinical placement. The invitation to participate in an exit interview at the completion of their placement was optional.

Eligible staff clinician participants were experienced Clinical Educators who supervised students and assisted in the treatment of patients within this clinic. These staff were invited to participate in an optional exit interview at the completion of their clinic employment.

Study Design & Data Collection

Group A acted as a quasi-control group by enabling the identification of any between-group differences. In addition, Group A allowed for examination of within-participant differences across time points to determine whether progress was quicker when seeing both services concurrently.

The speech function, speech distress, social function and psychological function subscales of the CLEFT-Q were administered alongside RhinoCleft® measures of speech intelligibility and acceptability to patient participants attending the clinic.[30, 32] The measures[30,32] were administered by requesting participants complete an online Qualtrics form prior to their first SLT appointment, at their fourth SLT appointment, at the conclusion of their SLT input, and 3-months following their final SLT appointment. Each CLEFT-Q scale contained 10 likert scale questions, except for the speech function scale which contained 12 questions. The RhinoCleft® consisted of two likert scale questions.

Following the conclusion of their final clinical appointment, patients were invited to participate in a brief interview to share their thoughts and experiences of participating in the clinic. Patient participants could complete the audio-recorded interview in-person, via Zoom, or via a phone call

according to their preference. Participants were asked about their experience at the clinic, utilising questions based on similar prior studies within the healthcare field.

Similarly, student and staff clinicians were invited to participate in an audio-recorded Zoom or in-person interview to share their thoughts and experiences of the clinic. Clinicians were asked about their experience of training and supports that were offered, working alongside another discipline, and whether there was any additional support that should be offered in future clinics. Interview schedules are presented in Table 1.

Table 1 – Interview Schedules

Patient Exit Interviews: Questions for Patient Participants	
Question	**Notes**
In your first or second session you will have spoken about goal-setting. What did you find helpful from this session?	*Followed up with prompt questions as required – i.e. What goals did you set? What goals have you achieved? Why do you feel you were un/able to achieve these?*
What did you think of the clinic?	
What helped you?	
If you could change any part of the clinic, what would it be and why?	
What did you think of the timing and commitment required of you by the clinic (regular weekly sessions)?	

How did you find the combination of therapy (SLT and Clinical Psychology)?	*Only asked if patients had accessed both services*
Did you find one service more useful than the other?	*Only asked if patients had accessed both services*
Were there any aspects of the timing or frequency of sessions that could be changed to improve ease of attendance?	
Do you think it would be useful to have Clinical Psychology as part of routine cleft care?	
What did you think of the activities within the clinic?	
What did you think about having student clinicians leading the sessions?	
Are you likely to recommend this clinic to another patient/parent? (Why/Why not)?	
Did you or your family receive any other speech language therapy or psychological therapy services during your involvement in this clinic?	*(If yes) Would you mind sharing how this clinic fit in with the work you did with other provider(s)?*
How would you suggest that we approach other parents/patients to give them information about a clinic like this?	
Is there anything we've discussed that you'd like more information about or are there any other resources I can provide for you at this time?	
Clinician Exit Interviews: Questions for Student & Staff Clinician Participants	
What did you know about cleft when beginning this placement?	
What do you feel you have learned about cleft as a result of this placement?	

What did you most enjoy about being enrolled in this clinic?
What were some of the clinical challenges you faced within this clinic?
What (if any) additional training do you feel would have been useful to prepare you for this clinic?
How did you find the presentation of the clients/patients to the clinic? Was there anything that surprised you about the client presentation?
How did you find working in a clinic alongside another discipline (Clinical Psychology if you're an SLT and vice versa)?
How did you find the communication tools and opportunities provided for cross-discipline working within this clinic (e.g. fortnightly joint supervision sessions, the Telegram group etc.)?
What else would have been helpful to facilitate effective collaboration between the disciplines?
What were some of the benefits of working alongside the other discipline?
What were some of the challenges associated with working alongside the other discipline?
How could we improve the clinic in the future?
Is there anything else that you would like to add?

Data Analysis

Quantitative data from the CLEFT-Q were analysed by converting raw scores to Rasch scores using the scoring instructions within the user guide.[33] RhinoCleft® scores gave a measure between 1-5 for both speech acceptability and intelligibility and did not require further conversion. Each participant code was allocated its own table in an Excel spreadsheet for the recording of their Rasch scores for the CLEFT-Q and raw scores for the RhinoCleft® to allow for deidentified tracking of each participant's progress. These scores were then collated for all patient participants using IBM SPSS statistical software (version 29.0.0.0 (241)). Quantitative data, including trends between and within participants are reported using descriptive statistics (mean and standard deviation) calculated within

SPSS for Group A, Group B, and the whole cohort. As the study is a pilot feasibility study, small sample sizes were anticipated, therefore comparison statistics were not planned or conducted.

Qualitative interview data were uploaded to OtterAI[34] and automatically transcribed. The first author reviewed the transcription while listening to the recording to amend transcription errors. Interview data were analysed using Conventional Content Analysis,[35-36] which was chosen given its utility to identify patterns and trends across an entire dataset, and for frequency counts to be ascribed to each code.

Results

Participants

A total of 26 participants provided data for this study. Patient participants (n=12) were aged 13-32 years (mean = 19.75) of which six were male and six were female. Nine patient participants (75.0%) chose to participate in an exit interview at the completion of the clinic.

A total of 11 student clinicians and three staff clinicians enrolled in the study (n = 14). Of these, 13 participated in exit interviews (92.9%). Due to an unforeseen storage synchronization error, one participants' audio recording was degraded to the point of being unusable and had to be excluded from data analysis, resulting in 12 clinicians' data being included in the final dataset.

The mixed-methods data from this study is presented below in the chronological order in which it was collected therefore, the quantitative data is presented first, followed by the qualitative patient exit interview data, and finally, the clinician exit interview data.

Quantitative Data

Rasch scores for each of the CLEFT-Q scales were calculated for each patient participant using the scoring manual for each timepoint. These are presented alongside the RhinoCleft® Speech Intelligibility and Speech Acceptability data for each participant in Table 2. CLEFT-Q scores are

scored out of 100 where 100 indicates no concerns, while RhinoCleft® scores are scored out of 5 where 5 indicates normal perceived intelligibility and acceptability.

Some participants did not have complete datasets. Reasons for this included only requiring a short block of therapy (4 sessions), therefore the 'during' measure on the fourth visit was also the 'immediate post' measure, while two others were lost to 3-month follow up. All participants had provided data for at least two timepoints and therefore all the data that was collected at all timepoints has been presented.

Table 2 – CLEFT-Q and RhinoCleft® Data

CLEFT-Q Speech Function				
	Pre	**During**	**Immediate Post**	**3-months Post**
Group A				
Patient 2	69	63	63	73
Patient 3	50	40	53	*
Patient 4	37	73	66	73
Patient 6	28	40	53	63
Patient 7	53	50	*	40
Patient 10	43	44	*	*
Group B				
Patient 1	15	31	44	57
Patient 5	60	*	80	69
Patient 8	8	8	24	34
Patient 9	44	47	50	37

Patient 11	40	73	53	100
Patient 12	53	53	69	69
Group A Average (SD)	**46.67 (14.18)**	**51.67 (13.55)**	**58.75 (6.75)**	**62.25 (15.56)**
Group B Average (SD)	**36.67 (20.82)**	**42.40 (24.41)**	**53.33 (19.57)**	**61.00 (24.37)**
Study Average (SD)	**41.67 (17.77)**	**47.45 (18.80)**	**55.50 (15.36)**	**61.50 (20.28)**
CLEFT-Q Speech Distress				
	Pre	**During**	**Immediate Post**	**3-months Post**
Group A				
Patient 2	90	72	100	100
Patient 3	63	56	60	*
Patient 4	42	56	52	83
Patient 6	39	49	56	77
Patient 7	52	60	*	68
Patient 10	32	42	*	*
Group B				
Patient 1	46	42	77	63
Patient 5	90	*	90	100
Patient 8	42	49	52	52
Patient 9	46	56	46	49
Patient 11	90	100	100	100
Patient 12	63	77	100	100
Group A Average (SD)	**53.00 (21.11)**	**55.83 (10.17)**	**67.00 (22.24)**	**82.00 (13.49)**
Group B Average (SD)	**62.83 (22.26)**	**64.80 (23.64)**	**77.50 (23.71)**	**77.33 (25.26)**

Study Average (SD)	**57.92 (21.31)**	**59.91 (17.27)**	**73.30 (22.51)**	**79.20 (20.52)**
CLEFT-Q Psychological Function				
	Pre	**During**	**Immediate Post**	**3-months Post**
Group A				
Patient 2	68	68	79	100
Patient 3	*	52	49	*
Patient 4	52	54	57	70
Patient 6	66	54	63	70
Patient 7	70	41	*	49
Patient 10	54	57	*	*
Group B				
Patient 1	66	52	63	70
Patient 5	92	*	100	100
Patient 8	68	52	49	52
Patient 9	76	92	73	70
Patient 11	100	100	100	100
Patient 12	100	61	92	92
Group A Average (SD)	**62.00 (12.70)**	**54.33 (8.69)**	**62.00 (12.70)**	**72.25 (20.98)**
Group B Average (SD)	**83.67 (15.62)**	**71.40 (22.93)**	**79.50 (21.17)**	**80.67 (19.62)**
Study Average (SD)	**73.82 (16.67)**	**62.09 (18.10)**	**72.50 (19.61)**	**77.30 (19.48)**
CLEFT-Q Social Function				
	Pre	**During**	**Immediate Post**	**3-months Post**
Group A				

Patient 2	76	76	91	100
Patient 3	45	50	43	*
Patient 4	71	76	73	100
Patient 6	52	45	48	58
Patient 7	62	73	*	58
Patient 10	54	50	*	*
Group B				
Patient 1	45	45	50	54
Patient 5	100	*	100	100
Patient 8	52	56	56	54
Patient 9	66	62	100	76
Patient 11	100	100	100	100
Patient 12	91	71	91	100
Group A Average (SD)	**60.00 (11.88)**	**61.67 (14.76)**	**63.75 (22.41)**	**79.00 (24.25)**
Group B Average (SD)	**75.67 (24.55)**	**66.80 (20.83)**	**82.83 (23.45)**	**80.67 (22.65)**
Study Average (SD)	**67.83 (20.13)**	**64.00 (17.02)**	**75.20 (23.88)**	**80.00 (21.95)**
RhinoCleft® Speech Intelligibility				
	Pre	During	Immediate Post	3-months Post
Group A				
Patient 2	4	4	4	5
Patient 3	5	3	4	*
Patient 4	5	5	5	5
Patient 6	3	4	4	4

Patient 7	3	3	*	4
Patient 10	4	4	*	*
Group B				
Patient 1	3	3	3	5
Patient 5	4	*	5	5
Patient 8	2	2	2	2
Patient 9	3	3	4	4
Patient 11	3	4	4	4
Patient 12	4	4	5	5
Group A Average (SD)	**4.00 (0.89)**	**3.83 (0.75)**	**4.25 (0.50)**	**4.50 (0.58)**
Group B Average (SD)	**3.17 (0.75)**	**3.20 (0.84)**	**3.83 (1.17)**	**4.17 (1.17)**
Study Average (SD)	**3.58 (0.90)**	**3.55 (0.82)**	**4.00 (0.94)**	**4.30 (0.95)**
RhinoCleft® Speech Acceptability				
	Pre	**During**	**Immediate Post**	**3-months Post**
Group A				
Patient 2	3	4	4	4
Patient 3	2	2	2	*
Patient 4	2	4	4	4
Patient 6	3	4	4	4
Patient 7	1	4	*	2
Patient 10	3	2	*	*
Group B				
Patient 1	2	1	2	4

Patient 5	5	*	5	4
Patient 8	1	2	1	1
Patient 9	3	3	3	3
Patient 11	4	4	4	4
Patient 12	5	4	5	5
Group A Average (SD)	**2.33 (0.82)**	**3.33 (1.03)**	**3.50 (1.00)**	**3.50 (1.00)**
Group B Average (SD)	**3.33 (1.63)**	**2.80 (1.30)**	**3.33 (1.63)**	**3.50 (1.38)**
Study Average (SD)	**2.83 (1.34)**	**3.09 (1.14)**	**3.40 (1.35)**	**3.50 (1.18)**

* denotes missing data

The CLEFT-Q and RhinoCleft® scores for each participant, in addition to group and cohort means and standard deviations are presented in Table 3. The standard deviations show that there is a large degree of variance between participants, with some having relatively high scores at baseline, and some having very low scores (e.g. range of 8-69 on CLEFT-Q Speech Function). Mean scores for both groups were higher at the immediate-post and 3-months post timepoints on the speech function, speech distress, and social function scales of the CLEFT-Q, as well as on both the RhinoCleft® measures of speech intelligibility and acceptability. Group A also demonstrated improvement over time on the CLEFT-Q psychological function scale, while Group B's mean score on this scale was largely unchanged from the initial timepoint to three-months post.

Patient Exit Interview Data

Nine of the patient participants also engaged in an exit interview. Interviews lasted 14 minutes on average (range 9-23). Using content analysis, their insights generated codes in three key areas: goal setting, experiences of the clinic, and perspectives on clinic design and delivery. These themes, their codes, frequency counts and exemplar quotes are presented in Table 3.

The qualitative data illustrate that most patient participants achieved the gains that they hoped to achieve when enrolling with the clinic. Many of the goals that patient participants recalled setting related specifically to areas of speech function. The data found patient participants' experience within the clinic to be positive. Patient participants commented on the cleft specialist expertise that was available within the clinic, and how in some cases this had been considerably different to the input they had received through other SLT services. Several patients commented on the specific strategies and education that they were provided; that this had been beneficial for understanding and remediating their difficulties, and that the strategies were functional and able to be applied in a real-world setting.

Patient participants also commented on the design and delivery of the clinic, with the most common code being that patients did not feel any changes were needed to the clinic, indicating broad satisfaction, a result reinforced by many patients who commented that they would recommend the clinic to a peer or had already done so. Patient participants commented that the increased frequency of therapy at the clinic relative to the hospital service had worked well for them, and some people commented that the pilot clinic offered greater flexibility with appointment times and modalities than other services. However, this was not the case for all participants, with a few commenting that there were some logistical and fatigue barriers associated with the clinic such as needing to take time off school or work to attend and finding the psychology sessions fatiguing.

Patient participants appreciated having student clinicians leading the sessions, often viewing this as a strength of the clinic, and for those who had been seeing another speech therapy service concurrently, they reported that the clinic worked effectively alongside their other service, with good communication between the two services. Patient participants also recognised the value of psychology input with many comments in support of the proposal that clinical psychology form a routine part of cleft care. Several patient participants reported not realising the value of the psychology services until they received them, with a couple of participants discussing that their work with the psychologist was challenging.

Table 3 – Patient Participant Exit Interview Themes

Theme One: Goal Setting		
Code	**Frequency**	**Exemplar Quote(s)**
I achieved my intentions of attending the clinic	10	"I wanted to become more confident in myself and have an improved voice, and for my /s/ sound to be clear – I've achieved those goals." "It's helped me tremendously, I can pronounce my words well now." "This has been the best clinic we've ever had at actually achieving our goals."
I partially achieved my intentions of attending the clinic	1	"I've partially achieved my goals – I can pronounce some words but am still having a bit of trouble pronouncing some of the big words."
I can't remember the goals	1	"I remember setting goals, but I can't remember what the goals were."
Theme Two: Experiences of the clinic		
Code	**Frequency**	**Exemplar Quote(s)**
Participating in the clinic was a positive experience	19	"Very friendly, very open, non-judgmental, empathetic – I like that I was able to be vulnerable with the clinicians." "You did everything we needed and more, thank you." "We'd really like to continue within the clinic if possible."

		"I want to extend my gratitude to you all – you guys have changed my life you know, it's your job 9-5 but to me it's been life changing. I'm really, really grateful."
The strategies learned in the clinic were effective in real-world settings	7	"Really helpful and practical – they've become second nature to me now." "The exercises in both SLT and Clinical Psychology were great – quick and easy for me to do during my normal routine and they were explained really well."
Specific intervention techniques were helpful	6	"The voice exercises really helped people to understand me." "Identifying when I need to swap what I am saying for something else that is more clearly understood." "Progressing from practicing a word on its own to using it in a sentence, to using it within conversation – that was really, really effective."
The clinic offered specialist cleft expertise	5	"Fantastic – you guys hit the nail on the head straight away and I couldn't be happier – I'm just disappointed I paid previously for many other private SLTs who didn't get to the bottom of it." "The clinic intervention felt well targeted to our needs rather than very generic therapy." "For the first time we felt that we were getting the amount of speech language therapy that we needed." "We came to you because no-one else would see us!" "It was the best assessment we've ever had – it's taken me 18 years to find out what I found out through you guys through the clinic."
The clinic was well organised	3	"It was better organised than the hospital clinic." "It was great to not have to worry about things like parking at the University clinic."

Education improved my understanding of cleft-related difficulties	3	"The listening exercises where I would listen back to what I had said and the clinician would explain how to produce the sound more clearly." "I'm in disbelief that I didn't know the reasons for the speech difficulties before – it's been the biggest help."
Theme Three: Perspectives on Clinic Design and Delivery		
Code	**Frequency**	**Exemplar Quote(s)**
I wouldn't make any changes to the clinic	17	"No change."
It was effective having student clinicians leading the sessions	16	"Very comfortable – they knew what they were doing." "Great – I forgot really that they were students." "Great – it's neat to see people getting experience working with cleft." "It was really cool – she was really interested in doing it right. I liked how she thought differently to [staff clinician] so you weren't only getting the one opinion." "Great – I picked up so much by hearing the discussions between the staff and student clinician."
I would recommend this clinic to a peer	11	"It's much more thorough than the service being delivered through the public hospital." "I already have!"
It would be useful to have Clinical Psychology as part of routine cleft care	10	"Yes and I feel that it should start younger, before the teenage years." "Definitely – I wish I had had access to this earlier in life, I think it would have made a big difference."

		"Definitely – I think other people with cleft would find it useful. For me, I've been doing quite well in my life so I didn't really feel that I needed it, but I can see how it would be really helpful." "People like me tend to get bullied and not be heard, and are not treated as normal like everybody else – people need support to find ways to deal with that."
The dosage of therapy was beneficial for me	9	"The weekly frequency of sessions was perfect for me." "It was great – the regular frequency meant that if I forgot to do something, it was okay because I was going back really soon and could fix it up." "It was hard and intense but that's what made it good, I like working hard!" "Having the sessions so close together was good as it meant I kept practicing and wouldn't get slack!" "The regularity was perfect – it wasn't too regular, but was regular enough that I saw the change happen quite quickly."
Receiving the combined service was beneficial	9	"Really good – I could see the change, working on my speech initially, and then working on how I felt about my speech." "It was great that the goals from both were quite similar and worked well together."
Logistical barriers to participating in the clinic	4	"It was a bit of a rush to get here sometimes and we had to take time off school to attend." "Some of the sessions were on a Friday afternoon and I just wasn't in the mood to talk to the psychologist on a Friday afternoon." "We had to take time off school and work to attend but that's just life.
Receiving the combined service was challenging	4	"It was a bit too much having them both on the same day." "It was quite tiring to try and take it all in."

		"It was hard initially to reflect back on how I was feeling but after I managed to do it, I felt a lot better." "It would be useful to have SLT and Clinical Psychology appointments on different days."
The clinic offered greater flexibility	3	"I liked being able to do it over Zoom – screen sharing was very useful." "It was great – the clinic was so flexible at fitting in appointments around my work commitments."
I didn't realise that I needed Clinical Psychology until I received it	3	"The speech language therapy made a really noticeable difference, but I definitely needed the psychology part as well." "Both together – I feel more confident with things like talking on the phone and ordering things – that used to make me very nervous and anxious."
It was hard to open up to a psychologist	2	"We got a lot from speech language therapy, it was harder to get a bit more personal and discuss feelings with the psychologist." "We got more out of the speech language therapy, the clinical psychology was hard work."
The clinic worked effectively in conjunction with other SLT services	2	"Yes – with the school Speech Language Therapist – it worked really well with regular contact between the UC student SLT and the school SLT." "Yes, at the start with a private therapist, but they focussed on literacy once they realised we were being seen at UC – there was good communication between the two services."

Staff and Student Clinician Exit Interview Data

Interview data from 12 participants are presented. Interviews lasted 23 minutes on average (range 14-44). Staff and student clinician insights analysed using content analysis generated codes in four key areas: prior knowledge about CL/P, new knowledge gained, facilitators to delivering optimal CL/P care within the clinic, and barriers to success within the clinic. These themes, their codes, frequency counts and exemplar quotes are presented in Table 4.

The findings show that most clinicians entering the clinic did not have much prior knowledge of CL/P, while others may have been aware of CL/P but had not worked with people with CL/P clinically or understood the holistic impacts of CL/P. The data illustrates that almost all participants acquired new knowledge during their placement. This commonly included gaining awareness of the heterogeneity of people with CL/P and their clinical need, and specific clinical information about CL/P and the treatment of people with CL/P. Clinicians acknowledged that the placement was an opportunity to develop their clinical skills by working with a complex population that there are typically few opportunities to work with within clinical training programmes. Several clinicians also commented that during the placement they had developed an understanding of CL/P as a condition which may continue to affect people well into adolescence and adulthood.

Clinician participants spoke highly of the opportunity to have worked within a multidisciplinary team and reported that effective multidisciplinary working was a key facilitator to delivering optimal CL/P care within the clinic. However, the results also show that a lack of multidisciplinary engagement at times posed the largest barrier. This was reported from clinicians of both fields where they felt that there could have been more effective engagement from both disciplines, as well as from external providers involved with the patient's care. Clinicians also reported the clinic had offered them worthwhile professional development opportunities and that they enjoyed working with the patients and seeing them progress within their care. Clinicians offered suggestions on how existing procedures could be improved, generally concerning the communication between the two disciplines. The clinicians also felt that provision of resources by the research team had been an important facilitator to optimum clinical care. Finally, several Speech Language Therapy clinicians reported a sense of

reduced burden on themselves knowing that the psychological needs of their patients were being attended to by trained Clinical Psychologists.

Staff and student clinicians indicated barriers to success within the clinic. An often-reported barrier was the complexity of the patients presenting to the clinic; clinicians felt that often the patients presented with challenging comorbidities that were not anticipated from the referral information. Furthermore, gaps in evidence-based practice for managing complex patients were also discussed with several participants noting that patients with comorbidities and/or syndromes have often been excluded from CL/P research resulting in a dearth of literature to determine best practice in these cases. Clinicians also reported various logistical challenges which posed barriers within the clinic, as well as patients themselves not fully understanding or engaging with aspects of the clinic. Several clinicians reported the lack of speech intelligibility for some patients made it difficult to conduct the sessions at times. A couple of clinicians also commented on feeling at a loss when SLT would not be able to achieve the desired outcome, yet surgical or prosthetic options were not available through the hospital cleft team.

Table 4 – Student and Staff Clinician Exit Interview Themes

Theme One: Prior knowledge about cleft		
Code	**Frequency**	**Exemplar Quote(s)**
Very little	8	"Only what I learned in the cleft lecture." "I'd heard of it but knew very little about it."
Not fully aware of the broader impacts of cleft	5	"I knew what cleft was but I didn't appreciate the extent of the impact it had on people and the length of treatment/number of surgeries." "I had only really thought about cleft as a condition that affected appearance."
I knew of cleft but had not encountered it clinically before	3	"I'd met with/knew of people with repaired cleft lip and/or palate but didn't know much about the condition itself." "A bit of the theory but had never encountered cleft clinically before."
Some prior knowledge and experience of cleft	2	"I knew of the incidence of cleft and that there are certain aspects of speech that are affected and that surgery alone doesn't remediate all cleft-related speech concerns." "I'd worked with people who had cleft lip and palate surgery on and off in the past."
Theme Two: New knowledge gained during the placement opportunity		
Code	**Frequency**	**Exemplar Quote(s)**

Increased awareness of individual variance	17	“How different one person’s cleft experience is to another person’s.” “How cleft impacts one person is quite different to another.” “The cleft population are massively diverse.”
Working with a novel and complex clinical population	12	“To explore an area I had not worked in before.” “Being able to work with a condition that is very medical in nature.” “The opportunity to work with such a diverse client group.” “Getting to work both syndromic and non-syndromic cases.”
Gained specific clinical information	10	“The impact of accompanying syndromes or other comorbidities.” “The impact of dentition/orthodontic considerations on cleft-related speech.” “The differences between compensatory and obligatory speech errors.” “How the surgeries themselves can impact upon speech.” “That cleft may have more of a psychological impact than expected.”
Developed clinical skills	10	“How to assess for and treat resonance and articulation disorders associated with cleft.” “Although being promoted as a specialty, treating cleft has a lot of transferrable skills from other areas of SLT.” “Knowing where to start when I have a cleft patient/client.” “The opportunity to learn and practice VPI assessment.” “Knowing the questions to ask.”

Recognition of cleft as a lifelong condition	8	"That cleft has a long and complex treatment pathway often requiring many surgeries – it's not "one and done"." "Cleft is never "finished"." "Despite general resilience, anxiety can persist for people with cleft."
Understanding of variation in clinical need	6	"There is no one specific approach for treating cleft-related speech concerns." "There are so many different types of potential speech difficulties." "There can be huge variability in surgical outcomes." "There is a huge variety of clinical goals."
The pathway to become an SLT who works with cleft	2	"I learned that there is no specific training pathway to be a 'cleft SLT'." "The role of SLT in cleft care."
Placement expectations were not met	1	"Not as much as I thought I would learn."
Theme Three: Facilitators to delivering optimal cleft care within the clinic		
Code	**Frequency**	**Exemplar Quote(s)**
Multidisciplinary working	25	"The opportunity to work in collaboration with another discipline." "Getting to work alongside the school-based SLT on intervention goals."

		"It was great to work in a multidisciplinary team." "Definitely the right idea to have a combined clinic." "Greater than the sum of our respective parts." "It was great to learn about what SLT do." "Learning so much about and from the other discipline – a new appreciation for what the other discipline does." "Reassuring to know that the other discipline were there and working with the clients too."
The clinic presents worthwhile professional development opportunities	18	"Being a part of something that's new and innovative." "Being a part of a service that is seeing people who otherwise couldn't access services." "Seeing the positive change in patients' speech and psychological outcomes." "The opportunity to connect with and get to know the patients/clients." "Seeing patients/clients recognise the difference in themselves."
Suggestions for building upon existing strengths	14	"Having the initial training session together with both SLT and Clinical Psychology instead of separate sessions." "Clear guidelines on what we can and can't say to the other discipline because of patient privacy." "Attendance at the fortnightly supervision sessions should be an expectation." "Shared teaching of cleft content across both the SLT and Clinical Psychology programmes."
Opportunities for supervision and peer working	13	"Fortnightly supervisions were really helpful when both disciplines were there." "Fortnightly supervisions sessions were valuable and useful for information sharing, collaborating, and getting help." "The supervision sessions were great for being exposed to other clients and understanding the breadth and diversity of cleft."

Provision of resources by research team	13	"The Telegram group was a very useful repository of resources." "It was great to have access to both the SLT and Clin Psych resources through the Telegram group." "It was great that everything was setup and there and that I didn't have to coordinate meetings myself."
Reduced burden on SLTs	5	"Clients seeing Clinical Psychology meant we could focus on our SLT sessions without worrying about having to provide counselling ourselves." "Knowing clients were having sessions with Clinical Psychology was good." "Great to focus on the SLT aspect and leave counselling/psychology to the Clin Psych."
Theme Four: Barriers to success within the clinic		
Code	**Frequency**	**Exemplar Quote(s)**
Lack of multidisciplinary engagement	25	"It would have been good to have collaborated more often." "It didn't really feel like Clin Psych were there." "I didn't have a lot to do with them directly but I enjoyed working alongside indirectly." "It would have been useful to have more Clin Psych attendance and input at fortnightly supervision sessions." "I had hoped the hospital SLT may have been able to offer more strategies/ideas for intervention."
Patients present with complex clinical needs	13	"Overcoming the complexity of the clients." "Challenging behavioural comorbidities."

		“More complex than anticipated – multiple comorbidities.”
Gaps in evidence-based practice	9	“Knowing which treatment approach to use.” “That the literature routinely excluded people with syndromes making it difficult to plan treatment for this group.” “I found it difficult to get info from the literature on how to treat cleft.”
Logistical challenges	9	“It was hard to do assessment sessions over Zoom.” “Being able to see all the clinical notes from both disciplines.” “Timetabling preventing SLT and Clin Psych being able to work together as much as would be ideal.” “Knowing how to contact the other discipline.”
Inappropriate or incomplete referrals	5	“Clients being referred to this clinic with complex non-cleft related needs as the health system didn’t know what to do with them.” “Poor communication/clinical notes from the hospital and/or referrer.” “Having patients with cognitive impairment which had not been identified/shared by the referrer.”
Lack of patient understanding of / engagement with clinical services	5	“Issues with poor/inconsistent attendance from clients/patients.” “Patients/clients not always having an understanding of psychology and what to expect before accepting a referral to psychology.” “Client’s reluctance to share pertinent information.” “That patients are accepting of suboptimal care provision.”

Impact of unintelligibility on therapy sessions	4	"I struggled to understand the patient as a result of their poor intelligibility." "The awkwardness of having to ask clients to repeat themselves." "How low some clients' speech intelligibility was."
Lack of availability of non-SLT treatment options for VPI	2	"When the anatomical differences couldn't be overcome to achieve greater intelligibility." "When people needed additional treatment but it was not available through public health – e.g. prosthetic options."
Lack of effective triaging	2	"Client was actually well adjusted so their benefit from the service was less immediately obvious." "A more robust screening process to ensure that people's primary presenting concerns are cleft-related."
Complex family dynamics	2	"Mismatch between client wishes and parents' wishes." "Having a parent join an adult client in the sessions."

Discussion

The aim of this study was to evaluate the effect of a pilot hybrid SLT and Clinical Psychology CL/P clinic on adolescents and adults' self-reported speech and psychological outcomes. The study also sought to understand patient and clinician experiences of such a hybrid clinic to identify facilitators and barriers for future iterations of such a clinic. The hypothesis that patient participants would experience gains in speech function, intelligibility and acceptability was met for most participants. Additionally, the hypotheses that patients would experience improvement in speech distress, psychological and social function, and that these gains would be most salient only after seeing Clinical Psychology was found to be true for many, although not all, participants. Finally, the hypothesis that clinician participants would report increased confidence and understanding of CL/P and the role of the other discipline was also met.

Adolescent and adult gains in speech function

Most participants within this study demonstrated sustained, positive change in the area of speech function. Previously documented unmet need for SLT in adolescence[1] and adulthood[11] is supported by the demand for this clinic from people aged 12 and over, a group who do not routinely have access to cleft-specific SLT services, including adults who were discharged from the cleft service some years ago. This unmet need is further supported within this study as participants reported the least satisfaction with speech function at baseline relative to the other CLEFT-Q measures. Some participants (1, 5, 8, and 11) provide examples of low speech function measures at baseline relative to other areas that made substantive gains through the clinic. Ongoing cleft-related SLT need has seen countries such as the UK and Australia include lifelong access to SLT in their CL/P service provision documentation.[4,37] Although New Zealand has recently developed SLT guidelines for CL/P, these do not provide recommendations or provision for adult CL/P care.[5] Given the improvement of speech function within this cohort, it would suggest that the inclusion of patient voice would influence recommendations for access to such services into adulthood.[38]

Effect of Psychological Input

Reinforcing the well-documented unmet psychological need within the CL/P population,[11,21,23-25] our

findings indicate that having a psychologist work through speech distress alongside a SLT is beneficial. For those who saw SLT and psychology services concurrently (Group B), their measure of speech distress improved to its greatest point by the time they reached the end of their intervention block. However, for Group A, by the time they had completed their SLT, they had not made all the speech distress improvements that they would eventually make. By contrast, in the time between immediate-post SLT and three-months post, there is a steep increase in improvement in speech distress score. During that time, Group A participants received Clinical Psychology services. This suggests that the psychological aspects of the treatment, or an interaction of the two treatments together where responsible for this improvement. Therefore, it is recommended that people have access to psychological services from the beginning of their therapy block; our research indicates that there is no benefit to delaying psychological intervention until after they have completed their SLT, but that gains are seen faster when a combination approach is taken.

This study has demonstrated the value of psychological input when there are speech concerns. Although participants in our study did not enrol in the clinic with the explicit intention to see psychology, they have reported both through their quantitative and exit interview data, that there are benefits to doing so. This is further demonstrated by some participants (e.g. 2, 4, and 6) reporting improvements in all areas of the CLEFT-Q, including psychological and social function.

Our results demonstrate that the psychological services on offer within this clinic were not taken up by all participants, and some individuals who received psychological care did not make improvements. Further work is needed to discern the exact reasons why psychology services did not appear to work for some people, it is possible that a general lack of understanding, and societal stigmas around accessing psychological support may be partially responsible.[39] In any case, it highlights the importance of ensuring resources are targeted to those who most require them, particularly where resources are low. Staff and student clinicians commented on the complexity of some of the patients and expressed concern that some patients did not appear to understand the role of psychology and the commitment associated with receiving the service. Furthermore, although Group B on average did not make substantive gains on the CLEFT-Q measure of psychological function, it is

hypothesised this difference may be due to this group having had higher baseline psychological function than Group A (83.67 c.f. 62.00). In locations where routine psychological input is provided, this is available from when a CL/P diagnosis is made,[3,4] whereas for our study, participants were encountering cleft-specific psychological services (and often psychological services in their entirety) for the first time. This lack of familiarity with the service may have resulted in less understanding of the aims of the service. Given the ultimate goal of having psychological services on every CL/P team, resources such as a pamphlet which explains the role and benefits of psychological services may be useful. For those who are accessing psychological services for the first time in late adolescence/adulthood, a more comprehensive resource designed specifically for this older age group has been found to be beneficial in the UK.[22]

A notable incidental finding from this study was that there were several occasions where participants had significant psychological concerns which extended beyond cleft-related concerns (e.g. profound autism and selective mutism). At the other end of the continuum were people who attended psychology but were well-adjusted to the point where the clinical psychologist could not identify targets for ongoing input. This is likely a result of introducing a psychological service in adolescence and adulthood; it is hypothesised that if psychological services were integrated into CL/P care from an early age that these far ends of the need continuum would be identified and catered for holistically throughout their care journey. Although more longitudinal research for CL/P is warranted, research in other areas of healthcare has found that preventative psychological intervention may reduce psychological distress later in life.[40-42]

Facilitators and Challenges

There are several facilitators and barriers to the success of this clinic which ought to be contemplated when considering replicating this service in New Zealand or elsewhere.

- *Free Services:* Even in countries where CL/P care is part of a publicly funded system, there are often costs associated for patients and their families which present barriers to accessing care.[43-44] By providing the clinic as a clinical education opportunity and utilising student clinicians within this clinic, this helped to offer a free service and reduce accessibility barriers.

- *Patient fatigue:* Initially back-to-back SLT and psychology appointments were offered to reduce patient travel time, however it became apparent that this was fatiguing to some participants. The protocol was adapted to provide additional options including utilising telehealth to reduce travel time burden, as well as offering appointments on alternate days to reduce fatigue. Where this wasn't practical for patients, the team worked with them to develop individualised options such as having appointments on the same day, but with a break in between to allow them opportunity for time between appointments.
- *Communication within the multidisciplinary team:* Working as part of a multidisciplinary team (MDT) was identified as a strong facilitator of success within the clinic, yet a lack of communication within the multidisciplinary team at times was also noted to be a common challenge. Future similar clinics should ensure that both disciplines are able to team regularly and that consistent attendance at group supervision sessions is set as a non-negotiable expectation, to ensure the benefits of the MDT are realised.
- *Accessibility of the university clinic:* Several participants commented on the relative ease of accessibility of the university clinic when compared to hospital clinics. Comments identified free on-site parking and unambiguous communication of key information such as subsequent appointment times as facilitators for accessibility.

Frequency of services

In addition to being able to offer therapy services to a cohort which would not otherwise have been able to access clinical input, one of the main opportunities of the University clinic was providing an increased frequency of therapy compared with what is available through the public health system. Generally, most patients were able to see an SLT and/or (dependent on group allocation) Clinical Psychologist at least once a week during their therapy block. Several participants commented on the frequency of the therapy being beneficial, and that they had made progress with this arrangement more quickly than they had in other settings.

Currently, CL/P teams do not have the necessary capacity to offer an increased frequency of therapy, despite its clinical benefits. A recent systematic review of intervention for residual speech errors in adolescents and adults found that people who receive SLT intervention weekly achieved modest gains, with those receiving intervention two or more times per week making more significant gains.[27-28] Our results demonstrate that adolescents and adults made substantive gains within a short-term block of weekly therapy, and that this intensity was efficacious within our study.

Methodological Considerations

This is a pilot study that has established feasibility of a hybrid SLT and Clinical Psychology clinic and produced compelling evidence to support recommendations for implementation and improvement of global CL/P services. However, there are important methodological considerations to review.

- *Sample Size:* As a pilot study to explore feasibility of a hybrid SLT and psychology clinic, the sample size for this study was necessarily small with 12 patient participants and 14 clinician participants. The positive findings gleaned from our descriptive and qualitative analyses suggests further investigation of a larger cohort is warranted to determine whether our findings are generalisable to the broader CL/P population. However, the study employed robust mixed-methods, collecting detailed quantitative data of patients and rich qualitative data of the experiences of both patients and clinicians. Taken together, this dataset tells the story of the people who accessed and worked in our clinic, providing detailed perspectives that can guide development of future clinics and studies.
- *Missing Data:* As has been reported, several patient participants did not complete some of their quantitative measures at all the requested timepoints. However, everyone had completed every measure for at least two timepoints, with most participants having three or four timepoints allowing for within-subject comparison over time. Three of the twelve patient participants did not respond to requests to complete an exit interview; therefore they were unable to contribute qualitative data to the study.
- *No specific intervention:* The study did not seek to make recommendations on which therapeutic models should be used with this patient group. Clinicians were free within the study to use

whichever therapy tools they deemed to be most suitable based on their assessment findings. This decision was in acknowledgement of the anticipated heterogeneity of presenting concerns and that a one-size-fits-all approach would be unsuitable. As a result, data were not gathered on whether certain therapy models resulted in greater gains than others.

Recommendations

There are several recommendations arising from this study, including for CL/P healthcare providers, clinical training institutions, and for future research which are outlined below.

CL/P Healthcare and Service Provision Recommendations

1) *Increased frequency and availability of cleft-related SLT services:* Based on the finding that demand was evident beyond age 12, and that gains were made up to age 32 within our study, it is recommended that SLT services be available for cleft-related speech concerns at any age, and that the frequency of the intervention is available on at least a weekly basis where required. Furthermore, sufficient early intervention should be prioritised to reduce the likelihood of speech concerns persisting beyond age 12.
2) *Routine access to Clinical Psychology assessment, and intervention (if required):* Given the psychological gains made by several participants within our study, it is recommended that people with CL/P access regular standardised and validated psychological screening assessment and that intervention services are available if the assessment indicates areas of psychological concern.
3) *Consider bespoke accessibility options:* Varying considerations for accessibility were reported as advantageous for engaging in therapy, including options such as telehealth, free parking outside the clinic, clear communication about appointments, and free services. Several recent studies have demonstrated that telehealth is clinically effective and leads to increased accessibility to services[45-49], although consideration should be taken to ensure telehealth services are equitably available[45,47-49], and that it should not be viewed as a replacement for face-to-face services.[46,48-49]

4) *Collaborative clinics between CL/P teams and University training programmes:* Clinical training programmes can provide adjunct services to hospital services. The benefits of this approach were evident for patients and training clinicians alike, offering supervised interventions that reflect latest knowledge for patients, and enabling placement opportunities to upskill the next generation of CL/P SLTs and psychologists. Finally, such clinics also are key to facilitating research opportunities.

Clinical Training Recommendations

1) *Combined training between SLT and psychology programmes:* CL/P team clinicians from various disciplines are routinely expected to work together within the CL/P MDT. CL/P-specialist knowledge (e.g. lectures) and clinical training should be included across both disciplines through combined teaching and training opportunities to strengthen the teaming which was identified as both beneficial and, at times, difficult to achieve.

2) *Establish country-specific CL/P SLT/Psychology Special Interest Groups (SIGs):* Our findings demonstrated that clinicians felt more confident working with CL/P following their enrolment within our clinic. To further develop clinician confidence working with CL/P, effective professional development and supervision is paramount. In countries which don't currently have CL/P SIGs, it is recommended that professional bodies partner with clinicians and researchers working on CL/P teams and elsewhere to establish CL/P SIGs that meet regularly to discuss best practice for cleft-related clinical services and determine priorities for clinically-relevant research[50].

Future Research

- *Efficacy of receiving SLT and Clinical Psychology services in the same session:* This study examined the effect of receiving psychology services alongside SLT services. However, many CL/P services are delivered within multidisciplinary teams, including CL/P clinic appointments

where multiple disciplines are present. It would be valuable to know if there is additional benefit in having psychology and SLT clinicians co-deliver services. A similar study in 2016 of student teachers collaborating in classroom-based intervention with student SLTs for children with speech sound disorders demonstrated benefits from such co-working.[51]

- *Identifying the most effective SLT and psychology approaches for supporting adolescent and adult patients with CL/P-related concerns:* There is little literature on adolescent and adult specific approaches in CL/P. Future research which seeks to evaluate various treatment approaches and develop an evidence-based practice map for adolescents and adults with CL/P is warranted.

Conclusion

This mixed-methods pilot study found that adolescents and adults benefit from frequent (once per week) CL/P-specific speech language therapy services with marked improvement in self-reported speech function, intelligibility and acceptability, and satisfaction on both quantitative and qualitative measures. Additionally, adding routine clinical psychology input resulted in improvements in self-reported measures of speech distress, psychological and social function. Participants qualitatively reported benefit in the psychological input. Staff and student clinicians from both professions found the clinic experience increased their understanding and confidence working with patients with CL/P, as well as their understanding of the other discipline. Clinicians reported effective multidisciplinary working to be a strong facilitator of success within the clinic. Recommendations are presented for ongoing access to SLT and psychological services for adolescents and adults affected by CL/P, increased intensity of services, and ongoing clinical placement opportunities. Finally, recommendations for future research are discussed to ensure the most efficacious therapies for adolescents and adults affected by CL/P.

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