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Title	Economic Evaluations of Speech and Language Therapy Interventions: A Scoping Review
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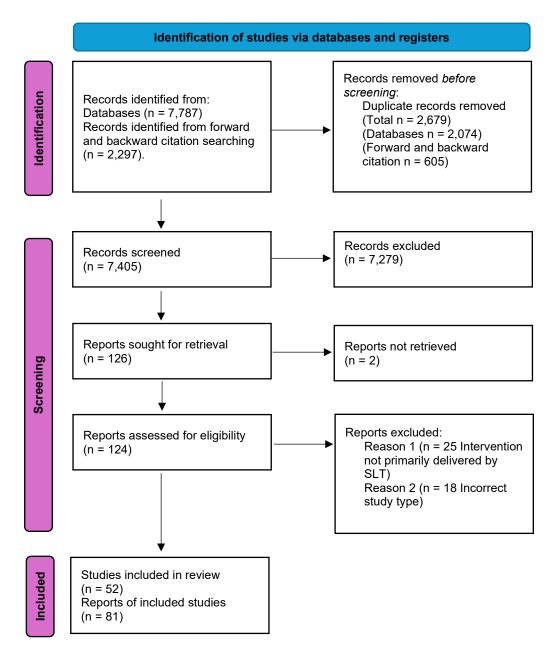


Figure 1: PRISMA flow Diagram

(Page et al., 2021)

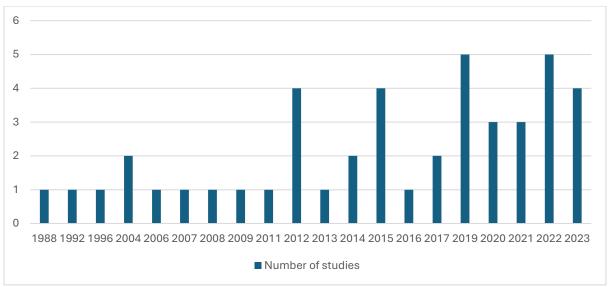


Figure 2: Number of cost analysis studies of SLT interventions published each year.



Key: ⁹ Single study location studies, ⁹ ⁹ ⁹ Multiple study location studies, ⁹ Protocol only studies.

Figure 3 Geographical location of studies which assessed the cost of SLT interventions.

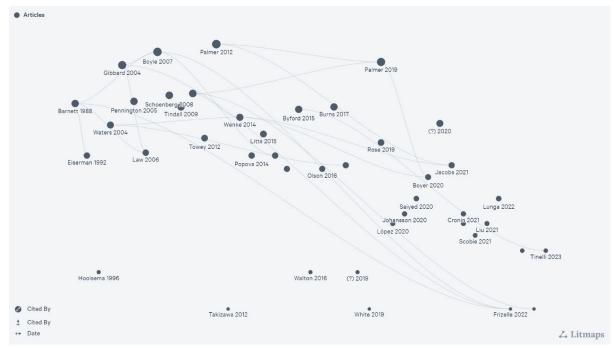


Figure 4: Citation map

Table.7¿Study.characteristics.of.studies.which.assessed.cost.or.cost_effectiveness.of.a.SLT.intervention.for.adult.stroke.patients.or.adult. with.aphasia.or.dysarthria;

Study names	Study design	Populatio n of interest	Clinical setting	Intervention type	Comparator (if applicable)	Type of economic evaluation	Perspective	Horizon	Outcomes assessed
(Bowen et al., 2012) Link papers: (Boyle et al., 2009; Davies, 2011; Nct, 2005, 2009)	RCT	Adult, Stroke, Aphasia or Dysarthria	Hospital inpatient and outpatients	Enhanced early communication therapy by Speech and Language Therapists	Attention control (equivalent amount of contact time (attention) as those in the intervention arm (up to three times a week, for up to 3 months)	Cost-utility analysis	Healthcare sector and patients/familie s	6 months	Functional Communicative Ability: Measured at 6 months post- randomization using the Therapy Outcome Measure activity subscale. Perceptions of Communication : Assessed through the Communication Outcomes After Stroke scale for participants and part of the Carer COAST for carers. Carer Well- being:

									Evaluated using the Carers of Older People in Europe Index and quality-of- life items from Carer COAST.
									Economic Evaluation: Included participants' utility measured by the European Quality of Life- 5 Dimensions, service use, cost data, and a discrete choice experiment.
(Jacobs et al., 2023) Link paper: (Jacobs & Ellis, 2021)	Before and after study	Adult Stroke Aphasia	Communit y	Community- based telerehabilitatio n approach [Language- Oriented Treatment] [telehealth]	No control group. Study was focused on comparison by aphasia subtype, but also compared outcomes by severity and race.	Cost- effectivenes s analysis	Healthcare payer	6 week	Aphasia Treatment Benefit: The therapeutic benefit was measured using the Western Aphasia Battery-Revised Aphasia Quotient before and after telerehabilitatio n treatment.

 1	-	 	Т	 	
					Marginal Cost
					of Treatment:
					The marginal
					cost was
					calculated based
					on the change in
					Western
					Aphasia
					Battery-Revised
					Aphasia
					Quotient and
					the average cost
					per treatment
					session.
					Cost-
					Effectiveness
					by Aphasia
					Type: The study
					evaluated the
					cost-
					effectiveness of
					treatment by
					comparing the
					improvement in
					Western
					Aphasia
					Battery-Revised
					Aphasia
					Quotient scores
					relative to the
					type and
					severity of
					aphasia.

(Kim et al., 2023) Link papers: (Godecke, Armstrong, Bernhardt, et al., 2014; Godecke et al., 2015; Godecke et al., 2017; Godecke et al., 2016; Godecke, Armstrong, Middleton, et al., 2014; Godecke et al., 2018; Kim et al., 2021)	RCT	Adult Stroke Aphasia	Hospital inpatient and outpatients	Very Early Rehabilitation in Speech (VERSE) intervention Usual Care Plus: usual ward-based therapy and 20 additional sessions (45–60 minutes, provided daily)	Usual care	Cost- effectivenes s	Societal perspective	26 weeks post- stroke	Costs: Estimation of costs for patients with aphasia after stroke based on the therapies provided. Healthcare Utilization: Analysis of healthcare resources used and productivity losses. Aphasia Severity: Measurement of clinically meaningful change in aphasia severity using the Western Aphasia Battery-Revised Aphasia Quotient Quality of Life:
									Comparison of the Stroke and Aphasia Quality

									of Life Scale-39 scores by study arm and baseline aphasia severity.
(Liu et al., 2021)	RCT	Adult Stroke Aphasia	Communit	Acupuncture therapy combined with speech and language therapy	Speech and language therapy alone	Cost utility analysis	Societal perspective	12 weeks	BDAE: Boston Diagnostic Aphasia Examination grades. CRRCAE: Chinese Rehabilitation Research Center Standard Aphasia Examination scores. QALYs: Quality- adjusted life- years. ICER: Incremental cost- effectiveness ratios for BDAE grade

					(2) Usual				improvement, CRRCAE score gain, and QALYs gained. Word Finding
(Palmer et al., 2019) Link papers: (Latimer et al., 2021; Palmer et al., 2015; Palmer et al., 2020; Palmer et al., 2011)	RCT	Adult Stroke Aphasia	In the service user's home	(1) Self- managed computerised (StepByStep aphasia software) speech and language therapy [telehealth]	care(Assessmen t and review of language abilities and their impact, rehabilitation of different language domains, enabling communication using communication aids or compensatory strategies, or support for mood, confidence, work, family, form completion, and information provision.) (3) Usual care + attention control (Puzzle	Cost utility analysis	v Healthcare sector	Lifetim e time horizon	Ability: The change in the ability to retrieve personally relevant words was measured using a picture naming test. Functional Communication: The change in functional communication ability was assessed by masked ratings of videorecorded conversations using the Therapy Outcome Measures. Self-Perception: The change in The change in

T T		Т		T	Τ	I	
			books (Sudoku,				patients' self-
			spot the				perception of
			difference,				communication,
			mazes, word				social
			searches, cross				participation,
			words,				and quality of
			colouring)).				life was
			5 ,,				measured using
							the
							Communication
							Outcomes After
							Stroke
							questionnaire.
							1
							Health-Related
							Quality of Life:
							This was
							measured using
							an accessible
							variant of the
							European
							Quality of Life.
							Instrument (EQ-
							5D-5L) for
							patients, and
							standard EQ-
							5D-5L
							completed by
							carers on behalf
							of patients.
							or patients.
							Carers also
							completed the
							CarerQoL
				<u>l</u>			questionnaire to

									assess their own quality of life. Adverse events compared. Recruitment and Completion
(Palmer et al., 2012)	RCT	Adult Stroke Aphasia	In the service user's home	Self-managed computerised speech and language therapy [telehealth]	Usual care (participation in activities that provide general language stimulation as they had done previously: attendance at communica tion support groups and conversation, reading, and writing activities that are part of everyday life)	Cost utility analysis	Health and social care system	Lifetim e horizon	and Completion Rates: The study aimed to determine the feasibility of recruiting and retaining participants for a randomized controlled trial. Clinical Effectiveness: The effectiveness of the computer therapy was measured by the change in word retrieval ability at 5 and 8 months from baseline. Cost- effectiveness was investigated by estimating total

									costs and total quality-adjusted life-years, incremental cost- effectiveness ratio.
									Intervention Feasibility: The study evaluated the ability of participants to carry out the self-managed intervention as prescribed.
(Rose et al., 2019) Link papers :(Ros e et al., 2015; Rose et al., 2021; Rose et al., 2022)	RCT	Adult Stroke Aphasia	Communit	1. Multi-Modal Aphasia Treatment [M- MAT] (3 hours mul-modality group therapy, 5 days a week for 2 weeks) 2. Constraint- Induced Aphasia Therapy Plus [CIAT-Plus]: (3	Usual care service-based aphasia therapy (Care as per usual in the community: estimated at <2h/week)	Cost-utility analysis	Healthcare system and patients	12 weeks	Primary Outcome: The primary measure was the Western Aphasia Battery-Revised Aphasia Quotient, assessed immediately after the intervention. Secondary Outcomes: These included the Western

				hours constraint- induced group therapy, 5 days a week for 2 weeks)					Aphasia Battery-Revised Aphasia at 12- week follow-up, naming scores, discourse measures, the Communicative Effectiveness Index, the Scenario Test, and the Stroke and Aphasia Quality of Life Scale-39g both immediately and at 12 weeks post- intervention.
									Economic Evaluation: The study also looked at incremental cost- effectiveness ratios compared with usual care at 12 weeks.
(Takizawa, Marty, & Roze, 2012)	Costing study	Adult Stroke Dysphagi a	Acute and inpatient	Swallowing disorder rehabilitative session	Managed dysphagia vs unmanaged dysphagia	Costing study	Healthcare payer	Not clear	Cost: The cost of speech and language therapy (unit

				Intensive					costs per patient) Spoken
(Wenke et al., 2014)	Non- randomise d controlled trial	Adult Stroke Aphasia	Hospital inpatient and outpatients	communication therapy by speech and language therapists (additional 1 – 1.5 hours of treatment employing either the use of 1. Computer therapy (software programs including REACT-2, Aphasia Tutor, Language Links, and Synonyms) 2. Group therapy (Fourto-six participants participated in each group therapy session	Speech pathology therapy assistant therapy (The tasks provided by the speech pathology therapy assistant were planned by the treating speech and language therapist and reflected similar tasks that participants received during their individual speech and language therapy)	Consequenc e analysis*	Healthcare sector	Not clear	Language Production: This included sub-tests for naming objects, naming actions, and word fluency. Disability Questionnaire: A standardized questionnaire measuring the impact of aphasia on daily life and emotional well- being. Organizational Outcomes: Data collected to determine the costs associated with each service delivery model.

				which was facilitated by a speech and language therapist)					Cost of service: pro-rata cost of providing treatment per hour per client. Client, Caregiver, and Clinician Satisfaction: Questionnaires evaluated the satisfaction levels of all parties involved with the intensive
(Dowlatshah i et al., 2019)	Protocol: RCT	Adult Stroke	Acute and inpatient	Mobile tablet- based speech therapy [telehealth]	Usual care (speech and language therapist)	Cost-Utility Analysis	Not clear	Not clear	Change in Western Aphasia Battery scores Cost- effectiveness incremental cost per one-unit improvement in AQ & incremental cost per one quality- adjusted life year.

									Stroke and Aphasia Quality of Life Scale
									Communicative Effectiveness Index
									Cognitive Linguistic Quick Test-Plus
									The 5-level EQ-5D version
									National Institutes of Health Stroke Scale
									Barthel index
									Modified Rankin Scale
(Spielmann et al., 2016)	Protocol: RCT	Adult Stroke Aphasia	Acute and inpatient	Transcranial direct current stimulation	Sham treatment (activated for 30 seconds and then deactivated to mimic the sensation of active tDCS without providing actual stimulation)	Cost utility analysis	Societal (productivity costs included)	6 months	Primary Outcome: The primary focus was on word- finding abilities, measured by the Boston Naming Test.

				Secondary
				Outcomes:
				These included
				measures of
				verbal
				communication,
				social
				participation,
				quality of life,
				and the cost-
				effectiveness of
				the intervention,
				Wong-Baker
				Faces pain
				rating scale.
				3
				Verbal
				Communication
				: Aphasia
				Severity Rating
				Scale and the
				Amsterdam
				Nijmegen
				Everyday
				Language Test
				Lunguage 1 est
				Quality of Life
				and
				Participation:
				Assessed using
				the European
				quality of life-
				5D, Stroke and
				Aphasia Quality
				of Life
				of Life

									questionnaire, and the Community Integration Questionnaire.
(Stahl et al., 2019)	Protocol: RCT	Adult Stroke Aphasia	Acute and inpatient	Transcranial direct current stimulation	Sham treatment (mimicked the initial tingling sensation of actual transcranial direct current stimulation)	Cost-utility analysis	Healthcare system and patients	12 months	Primary Outcome: The main focus was on communication ability, measured by changes in the Amsterdam- Nijmegen Everyday Language Test scores. Secondary Outcomes: These included assessments of linguistic- executive skills, attention, memory, emotional well- being, quality of life, health economic costs, and adverse events.

Key: * Defined by the authors as a cost-effectiveness study but did not actually combine cost and effectiveness outcomes, Grey area indicates a protocol for a study, COAST – Carer Communication Outcome after Stroke carer communication, QALYs – Quality-Adjusted Life Years, ICER – Incremental Cost-Effectiveness Ratio, BDAE – Boston Diagnostic Aphasia Examination grades, CRRCAE – Chinese Rehabilitation Research Center Standard Aphasia Examination scores, CarerQoL – Carer Quality of Life, RCT – Random controlled trial.

 $Table. 8 \cite{cont.} Study. characteristics. of. studies. which assessed. cost. or. cost_effectiveness. of. a. SLT. intervention. for. adult. with .aphasia. or. dysarthria;$

Study names	Study design	Population of interest	Clinical setting	Intervention type	Comparator (if applicable)	Type of economic evaluation	Perspective	Horizon	Outcomes assessed
(Boyer, Jordan, & Cherney, 2022)	Retrospective observational study	Adults with Aphasia	Acute and inpatient	Intensive Comprehensive Aphasia Programme	None (although running the programme again after the initial intervention was compared)	Costing study	Healthcare payer	4 weeks	Total Implementation Cost: The primary outcome measured was the total cost to the provider for implementing an Intensive Comprehensive Aphasia Program. Personnel Costs: A significant portion of the costs was attributed to personnel, especially the time of the Speech Language Pathologist.

									Break-even Charges: The study analyzed break-even charges per participant, which varied based on the number of participants.
									Cost Drivers: The main cost drivers identified were personnel costs and the number of participants in each cohort.
(Burns et al., 2019)	Non- randomised controlled trial	Adults with Dysphagia	Outpatient	Telepractice service model for conducting clinical swallow examinations implemented [telehealth]	Standard care, which involved scheduled/on- demand clinician visits to remote services or patients travelling to face-to-face assessment	Consequence analysis*	Healthcare payer	One off assessment	Waiting times: number of days Clinical session outcomes: no specific tool was described Service costs: total cost Consumer satisfaction: no

									specific tool was described
(Hobson et al., 2013)	Non- randomised controlled trial	Adults with Aphasia	Hospital inpatient	(1) Computer therapy [telehealth] (2) group therapy.	(3) Use of speech pathology therapy assistant	Consequence analysis*	Healthcare sector	11 weeks	Patient language function: no specific tool was described Attendance: no specific tool was described Cost of intervention: pro rata cost of intervention per hour
(Thomas, Burris, & Colon, 2020)	Retrospective observational study	Adults with Dysphagia	Acute and inpatient	Modified Barium swallow	Fiberoptic endoscopic	Consequence analysis*	Healthcare payer	One year	Discharge Disposition: The primary outcome measured is where patients were discharged to after their stay at the inpatient rehabilitation facility, particularly whether they were discharged

				home or to another type of facility.
				No specific description of the outcome for cost evaluation.

Key: * Defined by the authors as a cost-effectiveness study but did not actually combine cost and effectiveness outcomes

Table.9; Study.characteristics.of.studies.which.assessed.cost.or.cost_effectiveness.of.a.SLT.interventions.for.adult.head.and.neck.cancer. patients

Study names	Study design	Population of interest	Clinical setting	Intervention type	Comparator (if applicable)	Type of economic evaluation	Perspective	Horizon	Outcomes assessed
(Burns et al., 2017)	RCT	Adult Cancer, including head and neck cancer	Outpatient	Patient continuing to attend SLT appointments regionally but with specialist SLT support via telehealth with patient present)	Usual care: (attend appointments at their regional hospital with their local speech pathologist, while specialist support for the referred problem was provided by the Royal Brisbane and Women's Hospital speech pathologist to the regional speech pathologist predominantly without the patient present, via email/telephone contact when convenient and clinically indicated))	Cost consequence analysis*	Healthcare payer	11 months	Health Service Costs: Calculated based on staff wages, equipment, patient travel reimbursement, and other service- related expenses. Patient & Carer Costs: Included travel expenses, wages lost due to treatment, and quality of life impacts measured by the Assessment of Quality-of-Life questionnaire 4D. Quality-of-Life Quality-of-Life questionnaire 4D

									to measure changes in health- related quality of life for patients.
(Johansson et al., 2020)	RCT	Adult Cancer, including head and neck cancer	Outpatient	Voice rehabilitation	Usual care(general vocal hygiene advice according to clinical practice)	Cost utility analysis	Societal perspective	12 months	Voice Rehabilitation Efficacy: The effectiveness of voice rehabilitation post-radiotherapy. Quality-Adjusted Life Years: QALYs Healthcare Costs: Direct healthcare costs and loss of production were analyzed to determine the cost-effectiveness of voice rehabilitation. Cost- Effectiveness Analysis: The incremental cost- effectiveness ratio was calculated to compare voice

									rehabilitation with no rehabilitation intervention.
(Martino et al., 2017) Link paper: (Martino et al., 2015)	Feasibility study	Adult Cancer, including head and neck cancer	Outpatient	Mostly face to face, some follow ups completed via telephone	Standard care	Cost consequence analysis*	Patients and caregivers	3 months	Delay to removal of an enteral feeding tube after completion of treatment M.D. Anderson Dysphagia Inventory The Functional Assessment of Cancer The Functional Assessment of Cancer Therapy— Enteral Feeding Swallow Quality of Care questionnaire European quality- of-life Research

									Foundation, Rotterdam, Netherlands Functional Oral Intake Scale Body Mass Index Patient Self- Administered Financial Expenditure
(Waters et al., 2004)	RCT	Adult Cancer, including head and neck cancer	Outpatient	Swallowing rehabilitation intervention strategy (swallowing exercises 16 x 1 hour sessions)	Waiting-list control	Cost consequence analysis*	Patient and health care trust	8 months	Oral Transit Time Pharyngeal Transit Time Duration of Tongue Base Retraction Duration of Tongue Base to Pharyngeal Wall Contact at the Level of Inferior C2. Duration of Tongue Base to Pharyngeal Wall

				Contact at the Level of Superior C3
				Pharyngeal Delay Time
				Pharyngeal Response Time
				Duration of Hyoid Movement
				Duration of Laryngeal Elevation
				Oral Transit Time
				Pharyngeal Transit Time
				Duration of Tongue Base Retraction.
				Duration of Tongue Base to Pharyngeal Wall Contact at the Level of Inferior C2

(International Standard Randomised Controlled Trial Number, 2023)	Protocol: Feasibility study	Adult Ca ncer, including head and neck cancer	Outpatient	60-minute outpatient Speech and Language Therapy appointment once a week for 6 weeks	Usual care	Cost-utility analysis	Healthcare payer and patient	18 months follow- up	Pressure Measurements: Using High- Resolution Manometry at baseline and 3 months. Repeat Swallows: Number of repeat swallows measured with the 100 ml water swallow test Swallow Score: Patient report of swallow score using the MD Anderson Dysphagia Inventory Pharyngeal Constriction: Ratio measurement using video fluoroscopy swallow evaluation Diet Level Score: Clinician report using the
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									Functional Oral Intake Scale Neck Range of Motion: Score measured with a goniometer Cost- effectiveness: Assessed using the EuroQol EQ- 5D-5L health- related quality of life measure
(International Standard Randomised Controlled Trial Number, 2018)	Protocol: RCT	Adult Ca ncer, including head and neck cancer	Outpatient	Patients referred to group 1 or 2 will practice at home following an instruction session. Group 2 will receive an additional app to support in this delivery.	Receives speech therapist supervised therapy	Cost-utility analysis	Not explicitly stated	4 months	Swallowing Function: Assessed using the Mann Assessment of Swallowing Ability – Cancer, Eating Assessment Tool (EAT-10), a visual analogue scale for self- perception of swallowing ability, and the Functional Oral Intake Scale 50.

				Compliance: The
				degree of
				adherence to the
				exercise program
				is measured
				weekly through
				patient and
				therapist
				logbooks, the
				IOPI device for
				tongue
				strengthening
				exercises, and app
				usage data for
				Group.
				•
				Muscle Strength:
				Tongue strength
				is measured using
				the Iowa Oral
				Performance
				Instrument, and
				maximum muscle
				strength during
				Chin Tuck
				Against
				Resistance is
				assessed with a
				dynamometer1.
				Quality of Life:
				Evaluated using
				the Swallowing
				Quality of Life
				Questionnaire and
				Vaccinium c und

				the Dysphagia Handicap Index

Key: * Defined by the authors as a cost-effectiveness study but did not actually combine cost and effectiveness outcomes, Grey area indicates a protocol for a study, QALYs - Quality-Adjusted Life Years, RCT - Randomised controlled trial.

 $\label{lem:conditions:condition$

Study names	Study design	Population of interest	Clinical setting	Intervention type	Comparator (if applicable)	Type of economi c evaluatio n	Perspectiv e	Horizon	Outcomes assessed
(Hoolsema, 1996)	Before and after study	Adults with non-specific condition or problem	Acute and inpatient	Speech therapy	None	Cost- Effective ness Analysis	Healthcar e payer	9 months	Functional communication measure: designed by American Speech- Language-Hearing Association taskforce on treatment outcome. Cost: Total cost of speech and language therapy intervention.
(Litts et al., 2015)	Retrospective observational study	Adults with a Voice - related issues	Outpatient	Voice therapy	Study compared patients evaluated by a laryngologist and SLT against control group assessed by laryngologist only	Cost consequ ence analysis *	Healthcar e sector	3 months	Therapy Attendance: The study measured the number of therapy sessions attended and the number of cancellations or noshows. Voice Therapy Outcomes: Changes in Voice Handicap Index-10 scores

									Discharge Reasons: The reasons for patients being discharged from therapy, whether they met therapeutic goals or not
									Cost: The study examined the financial repercussions of co- assessment, including potential revenue lost due to missed appointments and the effect on SLP billing revenue.
(Lunga, Thibeault, & Francis, 2022)	Retrospective observational study	Respiratory care in adults	Unclear	Speech therapy	Costs for patients who initiated versus did not initiate speech therapy and who had successful versus unsuccessful therapy were compared	Cost consequ ence analysis *	Societal	12 months	Time to Diagnosis: The duration from the onset of dyspnoea symptoms to the diagnosis of Paradoxical Vocal Fold Movement. Healthcare Costs: Direct and indirect costs incurred before and after the diagnosis, including office visits, procedures, and prescribed pharmaceuticals. Lost Wages: Indirect

									lost wages due to healthcare visits. Treatment Outcomes: The dichotomy of therapy outcomes into successful (significant symptom improvement) and unsuccessful (persistent or worsened symptoms)
(Mills et al., 2019)	Before and after study	Adults with a Tracheostom y	Critical care	Assessed by SLT and patients only eating and drinking with the cuff inflated if found to be safe	Patients prior to implementation of change	Cost consequ ence analysis *	Healthcar e payer	10 months	Length of stay: intensive care unit length of stay & Ward length of stay Cost: Cost savings Total mortality for hospital stay Number of chest X- rays on intensive care unit.
(Sanz Lopez, Perez Marrero, & Rivera	RCT	Adults with a Voice - related issues	Outpatient	Standard SLT (traditional supervised speech	Tube phonation (performed exercises involving phonating into	Cost- Effective ness	Healthcar e payer	1 year	GRBAS Scale: The subjective evaluation of

Rodriguez, 2020)				therapy sessions)	water through a tube)				patients' voices using the GRBAS scale Cost-Effectiveness: Analysis of the healthcare costs associated with Tube phonation and Standard SLT treatments
(Schoenber g et al., 2008)	Non- randomised controlled trial	Adults with a Brain injury	Outpatient	Computer- based cognitive teletherapy rehabilitation [telehealth]	Face-to-face speech—language rehabilitation (rehabilitation was a programmatic outpatient speech and cognitive therapy program delivered in a face-to-face manner by certified and licensed speech—language therapists who had a minimum of 10 years' experience)	Cost consequ ence analysis *	Healthcar e sector	6 months	Independent Living: Determining if participants required in-home care. Independent Driving: Assessing if participants could pass a driving course or the state's driving examination. Return to Work/School: Evaluating if participants engaged in paid or volunteer work, or attended school classes for more than 31 hours per week3.

									Hours of Therapy: The total number of hours participants engaged in either teletherapy or face-to-face therapy. Cost: total cost of the treatment and a measure of service costs per hour.
(Towey, 2012)	Retrospective observational study	Mixed (adults and children) with vocal cord dysfunction	Communit y	1:1 Telehealth and some face to face [telehealth]	N/A	Cost consequ ence analysis	Healthcar e sector	1 month	Cost: cost savings
(Payten et al., 2022)	Protocol: Prospective observational cohort study	Adults with non-specific condition or problem	Outpatient	Speech— language pathology primary contact telehealth [telehealth]	N/A	Cost utility analysis	Limited societal	18 months	Case history information: case history questionnaire Voice aerodynamic measures of maximum phonation time in seconds and S/Z ratio Perceptual voice quality measures using the Consensus Auditory—Perceptual Evaluation of Voice

				Acoustic voice quality
				measures
				Voice- related quality of life: Voice Handicap Index- 10
				Self- reported symptoms of laryngopharyngeal reflux: Reflux Symptom Index
				Self- reported symptoms of laryngeal hypersensitivity: Newcastle Laryngeal Hypersensitivity Questionnaire
				Health-related quality of life scores measured using the validated Assessment of Quality of Life- 6D
				Diagnostic classification impression after speech—language pathology primary contact telehealth and
				laryngoscopy

Key: * Defined by the authors as a cost-effectiveness study but did not actually combine cost and effectiveness outcomes, Grey area indicates a protocol for a study, RCT - Randomised controlled trial, GRBAS - grade, roughness, breathiness, asthenia, strain.

Table. Study.characteristics.of.studies.which.assessed.cost.or.cost_effectiveness.of.a.SLT.intervention.for.children.with.a.range.of. conditions;

Study	Study design	Population of interest	Clinical setting	Intervention type	Individ ual being support ed if applica ble	Comparato r (if applicable)	Type of economic evaluation	Perspect ive	Horizon	Outcomes assessed
(Prathane e, 2011)	Before and after study	Cleft lip and palate (Speech), Early years and school, 3 to 13 years (majority 7-13 years)	Outpatie nt	Speech therapy provided by five speech and language pathologists, including individual and group therapy, for a total of 18 hours during the four-day speech camp and six hours in the one-day follow-up session.	Childre n and caregiv ers	Funding support for the 4-day speech camp and 1-day follow-up were investigate d for a compariso n of the expenses by individuals with Cleft lip and palate for services from the nearest and only	Cost consequence analysis*	Limited societal	6 months	Reduction of Articulation Errors: during the main speech camp and the one-day follow- up session Knowledge: Basic knowledge related to cleft lip and/or palate Cost: Funding support (health service) and expenses (patient) for Speech Camps

						speech center (Speech Clinic, Srinagarin d Hospital, Khon Kaen Province) in northeast of Thailand.				
(de Sonnevill e- Koedoot et al.,	RCT	Stammering Early years and	Outpatie nt	The Lidcombe Program intervention consists of two stages: Stage 1 with a median of 11 to 15 clinic visits and Stage 2 with at least 7 to 12 treatment sessions. The RESTART-	N/A	Speech and language therapy based on the Deman ds and	Cost-utility analysis	Societal perspecti ve	8 months	"Number needed to treat for one patient not to stutter at 18 months Decreased health related quality of life:
2015)		school, 3.0 to 6.3 years		DCM treatment involves weekly clinic visits with a mean of 12 treatment sessions, as per the pilot		Capacities Model (12 sessions)				EuroQoL EQ- VAS Health Utility Index-3

										Quality adjusted life years (V- QALYs & U- QALY)
										Cost— effectiveness ratio (one additional child who did not stutter at 18 months and Total cost"
(King et al., 2019)	Before and after study	Oropharyngeal dysphagia Age unspecified	Outpatie nt	Videofluorosc opic Swallow Study training and mentoring program utilising a remote specialist speech and language therapist attending the Videofluorosc opic Swallow clinic via realtime synchronous	Parents	None	Costing study	Not stated	Not stated	Percentage of families who would prefer their treatment to be delivered either via telehealth or at the clinic

				telehealth. [telehealth]						
(Raatz et al., 2023)	Cost minimisat ion	Eating/drinking/feed ing disorder Early years and school, < 10 years old, majority under 2 years	Outpatie nt	Tele-practice (using videoconferen cing) paediatric appointments [telehealth]	Parents	Face-to- face paediatric appointme nts	Cost cost consequence analysis*	Societal perspecti ve	12 months	Cost Savings: Per appointment for families. Service Costs: The health service costs were equivalent for both models, as the clinician's time remained the same for both tele- practice and in- person appointments.
(Finestac k et al., 2022)	Feasibilit y study	Proactive service for children with galactosemia Early years, Starting at <6 months	Commun ity	Babble Boot Camp (BBC) (Individualised sessions for parents to provide strategies to support their child's communicatio n development) [telehealth]	Parents	None	Costing study	Healthca re system and families	Period of sessions (based on individu als, with minimu m of 67 sessions)	Parent Satisfaction Survey: 5-point Likert rating scales Intervention Session Logs: The study tracked session attendance and

										modality (Zoom or email). Fidelity Checks: Videos were reviewed for adherence to key intervention components (review, teach, model, plan).
(Boyle et al., 2007) Link paper: (Dickson et al., 2009)	RCT	Language disorder School Primary (6 to 11 years)	Outpatie nt	(1) Direct individual therapy [speech and language therapist (SLT) working individually with a child], (2) indirect individual therapy [speech and language therapy assistant (SLTA) working individually with a child]	N/A	(3) Direct group therapy (SLT working with a small group of children)	Cost- Effectivenes s Analysiss	Teachin g setting	3.5 months	Language Outcome: Standardised scores on tests of expressive and receptive language (CELF-3) Vocabulary: standardised scores on the BPVS II Parental and teacher observational rating scales linked to the CELF-3

				Binary outcome measure: showed progress postintervention/ did not show progress postintervention Enderby's Therapy Outcome Measures (TOM),151 selected to provide standardised information about change of case status Qualitative data: questionnaire, focus group data from parents, teachers, project SLTs and speech and language therapy assistants.
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(Olson et al., 2016)	Before and after study	Language, speech sound or other developmental difficulty affecting speech and language Early years, 11-26 months	Commun	Training / education: Text messages to deliver developmental education to families [telehealth]	Parents	Not applicable	Costing study	Healthca re payer	3 months	Program completion rate Response rate to intraporal text messages Parental survey responses to questions (Likert Scale)
(Byford et al., 2015)	RCT	Neurodevelopmental conditions, including autism and ADHD (Social communication) Early years, 2 to 5 months	Outpatie nt	The intervention was the PACT (Pre-school Autism Communication Trial) therapy, which was a parent-mediated, communication-focused intervention delivered by specially trained speech and language therapists. It consisted of fortnightly one-to-one clinic sessions for six months, followed by	Parent	Usual care	Cost- Effectivenes s Analysis	Limited societal	13 months	Autism Symptom Severity: The severity of autism symptoms was measured using the ADOS-G social communication algorithm score Parent-Child Interaction: Video-rated parent-child interaction during naturalistic play was assessed Child Language and Social Communication:

				monthly booster sessions for an additional six months, aiming to target social interactive and communicatio n impairments in children with autism.						The study evaluated child language and social communication using the researcher- assessed Preschool Language Scales Adaptive Functioning in School: The Vineland Adaptive Behaviour Scales, Teacher Rating Form, rated by face-to- face interview with teachers, assessed adaptive functioning in school
(Tinelli et al., 2023)	RCT	Neurodevelopmental conditions, including autism and ADHD (Social communication)	Outpatie nt	Direct treatment sessions/ home training programme	Parents	Usual care	Cost- consequence analysis	Limited societal	6months	Severity of Autism Symptoms: Assessed using the total score of social communication algorithm items from the Autism

		Early years, 2 years to 4 years and 11 months								Diagnostic Observation Schedule- Generic.
										Child Language
										Parent–Child Dyadic Communication
										Social Difficulties
										Comorbid Psychopathology
										Estimate of Phrase Length
				Parent-based intervention						Word list
(Gibbard,	Non- randomis	Expressive language delay	Outpatie	(PBI) consisting of 11 fortnightly group sessions			Cost-	Healthca re		Reynell Developmental Language Scales
Coglan, & MacDon ald, 2004)	ed controlled trial	Early years, 22 to 36 months	nt	with set language objectives for parents to work on at home with their child	Parents	Usual care	Effectivenes s Analysis	system and families	8 months	Pre-School Language Scale—3 UK(comprehensi on and expression
										Mean length of utterance

(Law et al., 2006)	Non- randomis ed controlled trial	Primary language difficulties Early years	Early years setting, e.g. nurseries	Structured language curriculum with individualized planning, and daily intervention	Childre n	Usual care (Children receiving 'typical' provision in health service settings)	Cost consequence analysis*	Healthca re sector and families	6months	Language and Behaviour Improvements
(Frizelle et al., 2022)	Non- randomis ed controlled trial	Universal intervention for children from disadvantaged areas Early years	Preschoo ls	Community-based language intervention with group training and individual coaching ["Happy Talk"]	Childre n and caregiv ers	Usual care	Cost-utility analysis	Healthca re sector	8 months	Receptive Language Improvement: Pre-school Language Scale 5th edition comprehension score Total Language Improvement: Pre-school Language Scale 5th edition total score Health-Related Quality of Life: Child Health Utility instrument
(Cronin & Addo, 2021)	Longitudi nal data- retrospect ive cohort study	Speech, language and communication needs	Other	Speech and language therapy	Not specifie d	N/A	Costing study	Justice system	Not specified	Youth Antisocial Behaviour: The study measured various antisocial behaviours in

		Early years and school, for the 4 to 17 years								young people, including physical fights, skipping school, stealing, graffiti, carrying weapons, and more. (questionnaire) Youth Justice (YJ) Contacts: The study also examined contact with the system, including attending YJ conferences, being charged with offenses, appearing in court, and being convicted.
(Barnett & et al., 1988)	RCT	Language handicaps (Language/communi cation difficulty (various definitions)) Early years, 35- 59months	Outpatie nt	(1) Home based (parent-delivered) intervention, (2) center-based intervention, (3) both center- and	Parent	(4) No treatment (no interventio n services from the clinic during the	Cost consequence analysis*	Healthca re sector and patients/ families	13 months	Auditory comprehension and verbal ability: Measured using the Preschool

				home-based intervention		13-week period)				Language Scale - Revised Articulation proficiency: Assessed using the Arizona Articulation Proficiency Scale
(Wake et al., 2015) link paper: (Wake et al., 2012)	RCT	Language delay Early years, 4 to 6 years	Commun	Home based therapy sessions X 18 one hour (language (narrative skills, vocabulary and grammar) and preliteracy skills (phonological awareness and letter knowledge) were targeted)	Childre n and caregiv ers	Usual care	Cost consequence analysis*	Healhcar e system tFamilie s	24 months	Expressive and Receptive Language: The trial evaluated both expressive and receptive language skills (CELF-P2) Literacy Skills: The study looked at literacy-related skills, including word reading and spelling (Wide Range Achievement Test) Narrative Skills: Researchers assessed

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						narrative
						abilities, such as
						storytelling and
						understanding
						story structure
						(The Renfrew
						Language
						Scales: Bus
						Story Test)
						, ,
						Phonological
						Skills:
						Phonological
						awareness,
						which includes
						recognizing and
						manipulating
						sounds in words,
						was another
						outcome
						(Comprehensive
						Test of
						Phonological
						Processing)
						Pragmatic Skills
						(Social
						Language Use):
						The trial
						examined
						pragmatic
						language skills,
						which involve
						using language
						appropriately in

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						social contexts
						(Children's
						Communication
						Checklist)
						,
						Phonological
						short-term
						memory
						(Children's Test
						of Non-Word
						Repetition)
						Health-Related
						Quality of Life:
						Parent-reported
						measures
						assessed
						children's
						overall well-
						being and
						quality of life
						(Health Utilities
						Index and
						Paediatric
						Quality of Life
						Inventory)
						Behaviour: The
						study considered
						behavioural
						aspects related to
						language delay
						and intervention
						effects
						(Strengths and

										Difficulties Questionnaire)
(Popova et al., 2014)	Costing	Other congenital disorders, including foetal alcohol syndrome and cerebral palsy Early years and school, 2 to 19 years	Other	1:1 speech- language interventions (20-30 hours of intervention depending on the severity)	Childre n	N/A	Costing study	Healthca re sector	12 months	Prevalence of Speech and Language Disorders (SLD) among Children with Foetal Alcohol Spectrum Disorder Severity Levels of Speech and Language Disorders: The study categorized Speech and Language Disorders severity into three levels: normal, mildly impaired, and moderately-to- severely impaired.

(Eiserma n, Weber, & McCoun, 1992) Link paper: (Eiserma n, Weber, & McCoun, 1995)	RCT	Moderate speech sound disorder Early years 3 to 4 years old	Community	Educational training mothers in therapeutic techniques (mom and child home training at least four times a week with 40-minute visits twice a month by a speech and language pathologist)	Parent	Standard Weekly speech and language therapy (occasional homework)	Cost cost consequence analysis*	Healthca re system and families	7 months	Battelle Developmental Inventory Goldman-Fristoe Test of Articulation Patterned Syntax Elicitation Test Preschool Language Scale Test for Auditory Comprehension of Language Parenting Stress Index Family Adaptability and Cohesion Scales Structured Photographic Expressive Language Family Resource Scale
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										Family Support Scale Family Inventory of Life Events
(Actrn, 2020)	Protocol: RCT	Other	Commun ity	Online education online for parents with children (12 months - 36 months) with communicatio n difficulties [telehealth]	Parent	Face-to- face group workshop	Cost- consequence analysis	Healthca re payer	N/R	Parent report of identification of actions in relation to parenting a child with communication difficulty, as assessed by 10 point Likert scale Attendance
(Drks, 2022)	Protocol: RCT	Language disorder	Outpatie nt	Online interval small group of 2-3 children therap y (30 therapeutic sessions of 45 min each) [telehealth]	N/R	Standard face-to- face therapy (active interventio n: 30 therapeutic sessions of 45 min each)	Cost- effectiveness	Healthca re payer	N/R	Language development status Speech-language therapists' time consumption

Key: * Defined by the authors as a cost-effectiveness study but did not actually combine cost and effectiveness outcomes, Grey area indicates a protocol for a study, RCT - Randomised controlled trial, QALYs: Quality-Adjusted Life Years