Additional file 3: Data extraction chart

Complete data extraction

1st author's				Intention to									
name, year	Country	Study design	N (dropouts)	treat analysis	Age	Gender	PD severity	OD severity	Intervention	Comparator	Applied outcome measures + way of measurement	Timepoints	Frequency
				·	IG: 62.0 (SD±11.5) CG1: 62.8		IG: 2.8 (SD±0.8) CG1: 2.5 (SD±0.7)	FOIS: IG:59 (SD ±1.3) CG1:68 (SD±0.5)		CG1: no intervention CG2: swallowing	> FEES: - prior state of secretion in nasopharyngeal structures, oropharynx, laryngopharynx - presence/absence of: thickening on the posterior laryngeal wall, tremor in structures (BOT, vallecula), early escape, vallecular stasis in glossoepiglottic folds and pyriform sinus, penetration, tracheal aspiration, cough reflex - CSSE (presence/absence) - history of aspiration pneumonia - alert state, interaction attention/ability, postural control, fatiguability - awamess of the swallowing problem & of secretion - ability to manipulate flows - anatomy and oral, pharyngeal and laryngeal physiology - orofacial brose & sensitivity - oral apraxia, swallowing apraxia - gag pharyngeal contraction, cough and hawk - saliva awallowing - oral residue - delayed swallowing reflex, multiple swallowing - reduction in laryngeal elevation - wet voice - FOIS		,
Ayres, 2017	Brazil	CCT	32 (8)	No	(SD±6.2) CG2: 64.5 (SD±5.6)	m=18, f=6	CG2: 2.5 (SD±0.8)		Chin-down posture maneuver		> SWAL-QOL	pre, post (4w)	2
Baijens, 2012	Netherlands	Feasibilit/pilot study with control group	20 (N/S)	No	65.5 (46-81)	m=14,1=6	median: 2 (1-3)	mild to severe	SES (VitalStim), 3 different electrode positions applied in random order per subject	Healthy controls with same intervention	VFS:	during	1
Baijens, 2013	Netherlands	quasi-RCT	109 (19)	No	median: 68	m=66,1=24	median: 2(1-4)	mild to severe	IG1: traditional logopedic dysphagia treatment - SES of submental region; motor-level stimulation; IG2: traditional logopedic dysphagia treatment - SES of submental region; sensory- level stimulation		> FEES: - Preswallow posterior spill - Piecemeal deglutition - Delayed initiation pharyngeal reflex - Postswallow vallecular pooling - PAS - VFS: - Preswallow anterior spill - Preswallow posterior spill - Lingual pumping - Swallow hestlancy - Piecemeal deglution - Delayed initiation pharyngeal reflex - Postswallow oral residue - Postswallow oral residue - Postswallow vallecular pooling - PAS	pre, post (15d)	2

Byeon, 2016	Korea	RCT	33 (N/S)	No	IG: 63.8 (SD ± 8.2) CG: 65.1 (SD ± 9.5	m=31, f=2	IG: 15 ≤ H&Y 3; 3 > H&Y 4 CG: 11 ≤ H&Y 3; 4 > H&Y 4	N/S	Postural techniques + EMST	EMST	> VFS: - Functional Dysphagia Scale (FDS)	pre, post (4w)	2
Claus, 2021	Germany	RCT	53 (8)	No	IG: 67.3 (54.83; SD ± 9.5) CG: 67.1 (49.82; SD ± 7.7)	IG: m=19, f=5 CG: m=18, f=3	(G: 2.5 (2-4), CG; 2.6 (2-4)	N/S	EMST (calibrated)	EMST (sham)	> FEES (5-point scales): - premature spillage - penetration-aspiration events - residue - SWAL-GOC (German) - SWAL-GOC (German) - SWAL-GOC (Jeannan) - REG (Jeannan) - RE	pre, post (4w, 3m)	
Claus, 2021	Germany	noi	33 (6)	NO	CG. 67.1 (49-62, 3D ± 7.7)	CG. III=16, I=3	IG. 2.5 (2-4), CG. 2.6 (2-4)	IN/S	EM31 (calibrated)	EWOT (SHalli)	>SSA	pre, post (4w, 3m)	
Feng, 2019	China	сст	60 (N/S)	No	IG: 65.20 (SD ± 6.84) (54-84) CG: 64.66 (SD ± 5.27) (56-75)	m=38, f=22	N/S	>18 on the SSA (inclusion criterium)	Vocal training + conventional swallowing treatment		Evaluation of salivation: UPDRS II Drooling Severity and Frequency Scale (DSFS) Volce evaluation Maximum phonation time (MPT) -Maximum phonation decibel	pre, post (4w)	2
Heijnen, 2012	Netherlands	quasi-RCT	109 (21)	No	Median 68 (42-81)	m=65, f=23	Median 2 (1-4)	FOIS: median 7 (1-7	Traditional logopedic dysphagia treatment + NMES (VitalStim) of the supra hyoid musculature; Group 2 (NMES- M): motor level, Group 2 () (NMES-S): sensory level	Group 1: traditional logopedic dysphagia treatment	> FCIS > SWAL-QOL (Dutch) > MD Anderson Dysphagia Inventory (MDADI) (Dutch) > Dysphagia Severity Scale (DSS) > FEES > VFS	pre, post, 3m (DSS post each treatment session) 3 ((15)
Khedr, 2019	Egypt	RCT	33 (3)	No	IG: 60.7 (SD ± 8.8) CG: 57.4 (SD ± 10.0)	N/S	IG: 3.1 (SD ±1.1) CG: 3.5 (SD ±1.0)	SDO: IG: 17.4 (SD ±6.1) CG: 16.2 (SD±5.8)	Repetitive Transcranial Magnet Simulation	Sham	> HAY > IPDPS III > Instrumental Activities of Daily Living (IADL) > Salf-assessment scale of swallowing > SDQ > Arabic DHI > VFS (for 9 in IG, 6 in CG, pre, post) - pharyngeal transit time (PTT) - time of tirst superior-anterior movemnt of hyoid bone H1 - time when hyoid bone reached its max elevation H2 - time required for max elevation of the hyoid bone H2-H1 - PAS - postswallow residue	pre, post (2w, 1m, 2m, 3m)	5
Kondo, 2017	Japan	RCT	20, thereof 3 with PD (N/S)	No	IG: 80.4 (SD ±9.5) CG: 80.1 (SD ±5.9)	m=19, f=1	NS	N/S	Aural stimulation with capsalcin ointment	Aural stimulation with placebo ointment	> Endoscopic swallowing scoring: - Salivary pooling in vallecula and pyriform sinuses - The response of glottal closure retliex induced by touching epiglottis with endoscope: - The location of the bolus at the time of swallow onset assessed by endoscopic whiteout - The extent of pharyngeal clearance after swallowing of blue-dyed water - Total swallowing function - Sensory-Motor-Reflex-Clearance (SMRC) scale: - Sensory-Initiation of swallowing reflex as assessed by endoscopic whiteout - Motion: holding bolus in oral cavity and inducing taryngeal elevation according to instructions - Reflex: glottal closure and cough reflexes induced by touching epiglottis or arytenoids with endoscope - Clearance; pharyngoal deparance of bolus after swallowing	pre, post (5, 30, 60 min)	4
Logemann,			742, thereof 360					Aspiration of water on VFS (inclusion	Chin-down posture while	No postural adjustment during swallows of nectar and honey-thickened	> VFS: - Aspiration		
2008	United States	RCT	with PD (31)	No	range: 50-95	m=498, f=213	N/S	criterium)	consuming thin liquids	liquids	Preference for different interventions	during	1

										> SDQ > FEES:	
										bolus flow time bolus location when the swallowing reflex is triggered residue location penetration before/after swallowing	
								Video assisted swallowing		 aspiration before/after swallowing SWAL-QOL 	
						IG: 2.21 (SD ±0.79)		therapy (VAST) with		> SWAL-QOE > SWAL-CARE	pre, post (2w, 4w,
anor, 2013 Israel	RCT	42 (N/S)	No	68.8 (SD ±8.1)	m=24, f=18	CG: 2.19 (SD ±0.84)	N/S	conventional therapy	Conventional therapy	y > Pleasure of Eating (POE) Scale	6 m) 4
					m=8, f=14						
		24, thereof 10 with		IG: 70.5 (53-80)	IG: m=5, f=5				Swallowing training	> Electromyography in submental muscles	
agaya, 2000 Japan	CCT	PD (N/S)	No	CG: 72 (47-93)	CG: m=3, t=6	H&Y III = 8x, H&Y IV = 2	N/S	Swallowing training in PwPD	in HC	- premotor time (PMT)	pre, post 2
										> VFS: - horizontal displacement of the hyoid bone	
									Sham NMES	vertical displacement of the hyoid bone Videofluoroscopic dysphagia scale (VDS) total	
								NMES (VitalStim) with effortful		- VDS-oral phase	
				IG: 63.44 (SD ±13.55)				swallowing + conventional		- VDS-pharyngeal phase	
ark, 2018 Korea	RCT	18 (0)	No	CG: 54.67 (SD ±13.82)	m=8, f=10	< H&Y III	N/S	therapy	conventional therapy		pre, post (4w) 2
									Head neutral	> Pneumonia	continuously
							Aspiration of water		position with thickened liquids	> Death > Adverse events	during 3m, intervention
		515, thereof 255		IG: 81			on VFS (inclusion	Chin-down posture with thin	(nectar thick or	> Hospitalization	adherence continuously,
obbins, 2008 United States	RCT	with PD (213)	Yes	CG: 80	m=359, f=156	N/S	criterium)	liquids	honey thick)	> Adherence to intervention	weekly 36
										> VFS:	
										- PAS	
										- Oral transit time (OTT)	
										Pharyngeal transit time (PTT) Pharyngeal responese time (PRT)	
	Feasibilit/pilot					1 Hz: 2.9 (±0.3)				> EMG:	
asegbon,	study with					5 Hz: 2.1 (±0.6)				- Pharyngeal motor evoked potential (MEP) amplitudes	pre, post (0min;
021 UK	control group	12 (N/S)	No	70 (SD ±8)	m=10, f=2	PES: 1.8 (±0.3)	PAS≥2	1 Hz rTMS, 5 Hz rTMS, PES	Sham	- MEP latencies	for MEP 30min) 2 to 3
										> VFS:	
ilva-Arone.	Feasibilit/pilot study with							Prophylactic speech-language therapy associated with EMG		Dysphagia Outcome and Severity Scale (DOSS) SWAL-QOL	
021 Brazil	control group	6 (N/S)	No	73.1 (64-83) (SD ±6.2)	m=6, f=0	2.3 (2-3)	FOIS: 6.5 (6-7)	biofeedback	biofeedback	> FOIS	pre, post (3m, 6m) 3
							,			> VFS:	
										- PAS	
										- duration of hyoid movement	
										- onset of bolus transit	
										- UES-opening	
										- UES-widset - UES-closure	
										- laryngeal closure	
										- max laryngeal closure	
oche, 2010 United States	DCT	68 (8)	Yes	IG: 66.7 (SD ±8.9) CG: 68.5 (SD ±10.3)	m=47, f=13	renge II D/	mild to moderate	EMST (calibrated)	EMST (sham)	- laryngeal opening > SWAL-QOL	pre, pre, post (4w) up to 3
oune, 2010 United States	no I	00 (8)	168	UG: 68.5 (SD ±10.3)	ı∏=4/, ĭ=13	range II-IV	iiila to moderate		Embl (snam)	> OWAL-QUL	pre, pre, post (4w) up to 3
								Standardized out-of-hospital management: education, skill			
								training (oral muscle	Face and tongue		
								exercises, effective cough	training, eating		
								training, pronunciation	considerations and		
				IC: 71 4 (CD : 10 7)			Laural C 2	training, eating training,	dysphagia	Duranhania	
lei, 2017 China	CCT	217 (N/S)	No	IG: 71.4 (SD ±12.7) CG: 69.3 (SD ±11.3)	m=130, f=87	N/S	Level 6-3 (unspecified scale)	compensatory training with video and presentation)	rehabilitation guidance	> Dysphagia > Mis-inhalation	post (6m) 1
-, Viiiiu	-01	2.7 (1970)		22.00.0 (00 111.0)	100,1-07	1.0.00	(aopcomoc obdie)	und prodomation)	g=.341100	> VFS:	post (om)
										- Aspiration	
									crossover: 3 DBS	> SDQ	V1: during, SDQ
									conditions	> UPDRS III	post 30 min
								3 DBS conditions (sequence random order of 130 Hz, 60Hz	(sequence random	> FOG spells > FOG time	V2 (at least 6m later): during,
(ie, 2018 United States	PCT	11 (1)	No	68.5 (SD ± 5.9)	m=9, f=2	N/S	N/S	DBS off)	60Hz, DBS off)	> Walking difficulty perception	SDQ post 30 min 2

A-DHI: Arabic Dysphagia Handicap Index; CCT: Controlled Clinical Trial; CG: Control Group; CSE: Clinical Swallow Evaluation; DBS: Deep Brain Stimulation; DOSS: Dysphagia Outcome and Severity Scale; DSFS: Drooling Severity and Frequency Scale; DSS: Dysphagia Severity Scale; EMG: Electromyography; EMST: Expiratory Muscle Strength Training; FDS: Functional Dysphagia Scale; FEES: Fibreoptic Endoscopic Evaluation of Swallowing; f: female; FOG: Freezing of Gait; FOIS: Functional Oral Intake Scale; H&Y: Hoehn&Yahr; IADL: Instrumental Activities of Daily Living; IG: Intervention group; m: male; MDADI: MD Anderson Dysphagia Inventory; NMES: Neuromusclaur Electrical Stimulation; N/S: not specified; OD: Oropharyngeal Dysphagia; PAS: Penetration-Aspiration-Scale; PD: Pleasure of Eating; rTMS: repetitive Transcranial Magnetic Stimulation; SDQ: Swallowing Disturbance Questionnaire; SUAL-CARE: Swallowing Quality of Care Questionnaire; SWAL-QOL: Swallowing Quality of Life Questionnaire; QoL: Quality of Life; RCT: Randomized Controlled Trial; UPDRS: Unified Parkinson's Disease Rating Scale; VDS: Videofluoroscopic Dysphagia Scale; VFS: Videofluoroscopy of Swallowing; V1 / V2: Visit 1 / Visit 2