Inter-rater reliability, parent perception and clinician satisfaction with bottle feeding assessments conducted via telepractice

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BACKGROUND

- Parents of children with feeding disorders report a range of issues that impact their ability to access paediatric feeding services [1]. Telepractice has been suggested as a service model that may improve service access [1,2].
- Whilst the validity of conducting adult clinical swallowing assessments via telepractice has been established [3-5], there has been limited research in the paediatric population [6-8]. No known studies have specifically investigated bottle feeding.
- Kantarcigil et al. [6] explored **asynchronous** paediatric feeding assessments conducted with children with cerebral palsy aged 5 – 17 years, identifying high levels of inter-rater reliability.
- Raatz et al. [7,8] proposed a model for conducting **synchronous** (real time) paediatric feeding assessments via telepractice, however the reliability of conducting bottle feeding assessments using this system architecture has not yet been established.

RESEARCH AIMS

Primary Aim: To determine the inter-rater reliability of bottle feeding assessments conducted via telepractice in patient homes.

Secondary Aims: To examine consumer perceptions and clinician satisfaction with this mode of service delivery.

METHODS

Participants:

- Infants and children referred for bottle feeding assessments were recruited from a statewide specialist paediatric feeding service. To be eligible to participate children had to:
  1) Be referred for assessment/review of bottle feeding
  2) Reside within 40km of the Queensland Children's Hospital
  3) Have a parent with English language proficiency sufficient to complete the appointment without an interpreter
  4) Have internet access in family home.
- 31 children (aged 4 weeks – 25 months) participated in an assessment
  - Initial appointment n = 13, follow-up appointment n = 18
  - 26% of children had ≥ 3 body system impairments.
  - Most common impairments: respiratory (65%) & history of prematurity (58%).
  - A range of feeding severities were represented (rated by the in-person SLP during the appointment on the Functional Oral Intake Scale – Suckle Feeds and Transitional Feeds).
    - 6 - Total oral intake with no restriction relative to peers (23%), 5- Total oral diet with compensation (29%), 4- Total oral diet with special preparation (10%), 3 - Tube dependent with consistent oral intake (35%) and 2 - Tube dependent with minimal oral intake (3%).

Study protocol: Children's bottle feeding skills were assessed in their home using the system architecture described by Raatz et al. [7]. Each child was simultaneously assessed by 2 speech language pathologists (SLPs) randomly assigned to either the (a) telepractice condition (T-SLP) or (b) in-person condition (IP-SLP) as demonstrated in Figure 1.

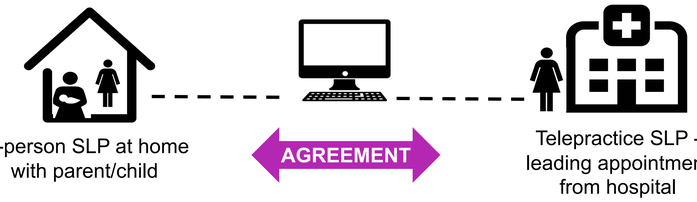

Figure 1. Simultaneous assessment model used for study

Data collection:

- A purpose-built assessment form was used to guide evaluation of: 1) general development, 2) state, colour & respiration, 3) oral motor function (including oral reflex and non-nutritive suck assessment), 4) positioning, 5) bottle feeding, 6) overall assessment and 7) recommendations (Fig. 2-3).
- Parent perceptions were investigated using the *Perceptions of Telepractice Feeding Services Questionnaire (*modified from previous research [3]) administered pre and post appointment.
- Clinician satisfaction was measured using the *Clinician Satisfaction Questionnaire* modified from previous telepractice studies [4,5] . The T-SLP completed this questionnaire after the appointment.

Data analysis: Percentage exact agreement (PEA) between T-SLP and IP-SLP ratings was set at ≥ 80% for nominal/ordinal data, and Kappa of >0.6 set for interval data [3-5].

Figure 2. Clinician instructing parent to complete infant oral reflex assessment

Figure 3. Infant having bottle feed assessed via telepractice

RESULTS & DISCUSSION

Assessment reliability:

- High levels of agreement (>80%) were reached for all assessment elements except for assessment of palate integrity (Table 1).

Table 1: Assessment component	% Exact agreement	Kappa coefficient
Developmental assessment	94	0.84
State		
Pre feed	88	-
During feed	93	
Post feed	87	
Colour	100	-
Pre feeding respiration	99	-
Oral motor assessment	89	-
Palate	35	0.28
Infant oral reflex exam	83	-
Non-nutritive suck assessment	92	-
Bottle feeding assessment	95	
Oral phase items	91	0.56
Suck-swallow-breath coordination	97	0.88
Physiological stability	94	0.78
Engagement cues	92	0.92
Respiration	98	0.81
Clinical signs of aspiration	97	0.69
Overall assessment rating	100	-
Session outcome (e.g. review vs discharge)	100	-

Parent satisfaction (n = 25):

- Parents' perceptions of telepractice improved after the appointment, with this change detailed for 4/15 questions in Table 2.
- In free-text comments many parents expressed preference for hybrid model of care (i.e. combination of telepractice and in-person services):
  - B07: *"I think it is a brilliant idea. Saves time and money, means a more relaxed environment and less time in hospital. It also allows a more accurate idea of a typical feed"*
  - B06: *"I don't think telehealth assessments should replace face to face assessments completely, but perhaps the option of predominantly telehealth with occasional face to face reviews"*

Table 2: Perception of Telepractice Feeding Services (parent-rated) (N = 24)

	Pre-appointment			Post-appointment			Chi
	Disagree	Unsure	Agree	Disagree	Unsure	Agree	
I feel (felt) comfortable having my child's feeding assessed via telepractice	0	2 (8%)	22 (92%)	0	1 (4%)	23 (96%)	0.917
It will be (was) easy to set up for the telepractice appointment	0	8 (33%)	16 (77%)	1 (4%)	1 (4%)	22 (92%)	0.283
I feel the telepractice assessment will (did) accurately represent my child's feeding skills	0	9 (38%)	15 (62%)	2 (8%)	0	22 (92%)	0.057
I feel that the online feeding assessment will be (was) equal to an in-person assessment	2 (8%)	10 (42%)	12 (50%)	1 (4%)	4 (17%)	19 (79%)	0.129

Clinician satisfaction

- Clinician satisfaction was high; on 90% of occasions T-SLPs agreed that telepractice was an effective service delivery method.
- The T-SLP reported they would re-offer telepractice services to 93% of children based on their session. Improved assessment ability in the home environment was the most frequently reported reason for re-offering telepractice services.

CONCLUSIONS

Bottle feeding assessments conducted via telepractice were comparable to in-person assessments for almost all tasks. This evidence, in combination with high levels of clinician and parent satisfaction, support the potential of telepractice to improve access to feeding services for families who prefer to receive telepractice services, or when limitations to in-person care exist.

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REFERENCES

1. Raatz, M., Ward, E. C., Marshall, J., Afoakwah, C., & Byrnes, J. (2020). "It takes a whole day, even though it's a one-hour appointment!" Factors impacting access to pediatric feeding services. *Dysphagia*. https://doi.org/10.1007/s00455-020-10152-9
2. Fairweather, G. C., Lincoln, M. A., & Ramsden, R. (2016). Speech-language pathology teletherapy in rural and remote educational settings: Decreasing service inequities. *International Journal of Speech-Language Pathology*, *18*(6), 592–602. https://doi.org/10.3109/17549507.2016.1143973
3. Sharma, S., Ward, E.C., Burns, C., Theodoros, D., & Russell, T., 2011. Assessing Swallowing Disorders Online: A Pilot Telerehabilitation Study. *Telemedicine and e-Health*, 17 (9), 688–695.
4. Ward, E.C., Sharma, S., Burns, C., Theodoros, D., & Russell, T., 2012. Validity of conducting clinical dysphagia assessments for patients with normal to mild cognitive impairment via telerehabilitation. *Dysphagia*, 27 (4), 460–472.
5. Ward E.C, Burns, C., Theodoros, DG, & Russell, T (2014). Impact of dysphagia severity on clinical decision making via telerehabilitation. Telemedicine and e-Health. 20,4, 296-303.
6. Kantarcigil, C., Sheppard, J. J., Gordon, A. M., Friel, K. M., & Malandraki, G. A. (2016). A telehealth approach to conducting clinical swallowing evaluations in children with cerebral palsy. *Research in Developmental Disabilities*, *55*, 207–217. doi:10.1016/j.ridd.2016.04.008
7. Raatz, M., Ward, E. C., Marshall, J., & Burns, C. L. (2019). Developing the system architecture for conducting synchronous paediatric feeding assessments via telepractice. *Journal of Telemedicine and Telecare*, *25*(9), 522–558. doi:10.1177/1357633X19872091
8. Raatz, M., Ward, E. C., Marshall, J., & Burns, C. L. (2021). (In-Press). Evaluating the use of telepractice to deliver pediatric feeding assessments. *American Journal of Speech-Language Pathology*