

Engaged Eaters Program-Early Development (EEP-ED) Delivered via Telehealth for Young Autistic Children: A Clinical Case Study

Asmita Mudholkar, Brittany St John, Larissa Korostenski, Kristelle Hudry & Alison E. Lane

To cite this article: Asmita Mudholkar, Brittany St John, Larissa Korostenski, Kristelle Hudry & Alison E. Lane (2025) Engaged Eaters Program-Early Development (EEP-ED) Delivered via Telehealth for Young Autistic Children: A Clinical Case Study, *Physical & Occupational Therapy In Pediatrics*, 45:6, 848-864, DOI: [10.1080/01942638.2025.2522759](https://doi.org/10.1080/01942638.2025.2522759)

To link to this article: <https://doi.org/10.1080/01942638.2025.2522759>



© 2025 The Author(s). Published with license by Taylor & Francis Group, LLC



Published online: 24 Jun 2025.



Submit your article to this journal [↗](#)



Article views: 1761



View related articles [↗](#)



View Crossmark data [↗](#)



CASE REPORT



Engaged Eaters Program-Early Development (EEP-ED) Delivered via Telehealth for Young Autistic Children: A Clinical Case Study

Asmita Mudholkar^{a,b,c} , Brittany St John^{a,d} , Larissa Korostenski^e ,
Kristelle Hudry^f , and Alison E. Lane^a

^aOlga Tennon Autism Research Centre, School of Psychology and Public Health, La Trobe University, Melbourne, Australia; ^bCentral Queensland Centre for Rural and Remote Health, James Cook University, Emerald, Australia; ^cSchool of Health, The University of the Sunshine Coast, Sippy Downs, Australia; ^dDepartment of Rehabilitation Medicine, Division of Occupational Therapy, University of Washington, Seattle, WA, USA; ^eDepartment of Neonatology, John Hunter Children's Hospital, Newcastle, Australia; ^fDepartment of Psychology, Counselling and Therapy, School of Psychology and Public Health, La Trobe University, Melbourne, Australia

ABSTRACT

Introduction: Feeding difficulties are associated with significant caregiver stress. Caregiver-mediated feeding programs in the family home may be appropriate for addressing the feeding challenges. However, very little literature reports on the feasibility and effectiveness of caregiver-mediated approaches for feeding difficulties.

Objective: The aim of the study was to examine the feasibility and impact of the (EEP-Early Development (ED)-Telehealth for a young Autistic toddler assessing parent satisfaction, telehealth delivery mode, family-centric feeding goals, parental stress and perceived competence to improve his feeding outcomes, including his meal-time behaviors and increasing his food repertoire and equipping caregivers with strategies to manage challenging behaviors.

Methods: A 28-month-old autistic toddler with feeding difficulties and his caregivers participated in the EEP-ED, delivered *via* telehealth. Feasibility was evaluated *via* parent satisfaction and telehealth delivery questionnaires pre- and post-intervention. The primary outcome was family-centred feeding goals measured using Goal-Attainment Scaling (GAS).

Results: Family-centric feeding goals were achieved, including increasing the child's dietary repertoire by 14 new foods and achieving independent drinking and eating. The mother reported high satisfaction, decreased parenting stress, and increased parenting competence.

Conclusion: Caregiver-mediated interventions delivered *via* telehealth may be a feasible and effective approach to address mealtime and feeding challenges of young autistic children.

ARTICLE HISTORY

Received 10 September 2024
Accepted 17 June 2025

KEYWORDS

Autism; caregiver-mediated interventions; case study; feeding difficulties; occupational therapy; Telehealth

CONTACT Asmita Mudholkar a.mudholkar@latrobe.edu.au; asmita.mudholkar@jcu.edu.au; amudholkar@usc.edu.au
 Olga Tennon Autism Research Centre, School of Psychology and Public Health, La Trobe University, Melbourne, Victoria, Australia

Identity first language is used to align with the majority of the autism community (Bury et al., 2023; Kenny et al., 2016; Lei et al., 2021).

© 2025 The Author(s). Published with license by Taylor & Francis Group, LLC








This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

GRAPHICAL ABSTRACT

Engaged Eaters Program-Early Development (EEP-ED) Delivered via Telehealth for Young Autistic Children: A Clinical Case Study


A descriptive clinical case study examining: the feasibility and impact of the (EEP-Early Development (ED)-Telehealth for a young Autistic toddler assessing.

- Telehealth delivery mode
- Parent satisfaction,
- Family-centric feeding goals,
- Parental stress and
- Perceived competence to improve his feeding outcomes.

Methods	Results	Conclusion
<p>3 Phases:</p> 	<p>Increased dietary repertoire by adding 14 new foods (from eight food items at baseline)</p>	<p>Caregiver-mediated interventions delivered via telehealth may be a feasible and effective approach to address mealtime and feeding challenges of young autistic children.</p> <p>Empowering caregivers to be the agents of change may be a promising method to promote positive mealtime experiences.</p>
<p>One caregiver-child dyad (28-month-old autistic toddler and his mother)</p> 	<p>Independent eating and drinking</p> 	
<p>24 feeding intervention sessions delivered twice weekly over a four-month period</p> 	<p>Decreased parenting stress</p> 	
<p>Delivered via telehealth by an occupational therapist</p> 	<p>Increased parenting competence</p> 	

Mudholkar, A., St John, B., Korostenski, L., Hudry, K. & Lane, A. (2025)

Olga Tennon Autism Research Centre, School of Psychology and Public Health, La Trobe University, Melbourne, Australia



Olga Tennon
Autism Research Centre

Feeding difficulties impact 46–89% of autistic children (Ledford & Gast, 2006), and autistic children are five times more likely to have feeding difficulties than their neurotypical peers (Sharp et al., 2013). Feeding difficulties can present as significantly limited food preferences, hypersensitivity to food textures or temperatures and pocketing food without swallowing (Mayes & Zickgraf, 2019). The consequences of persistent feeding difficulties in childhood are significant without early support persist into adolescence and adulthood, presenting in obesity, eating disorders, and mental health challenges (Ashley et al., 2020; Demir & Özcan, 2022).

Feeding problems in autistic children appear early and progress more rapidly as compared to their neurotypical peers with picky eating (Ashley et al., 2020). Caregiver stress is significantly exacerbated for those with an autistic child with feeding difficulties (Burkett et al., 2022), in addition to existing high caregiver stress in autism (Enea & Rusu, 2020; Zlomke et al., 2020). The combination of challenging behaviors at mealtime (Leader et al., 2020) and limited dietary repertoire contributes to already high levels of caregiver stress in autistic children with feeding difficulties (Sharp et al., 2013). Findings from previous studies indicate that interventions for autistic children are less effective when their caregivers experience high levels of stress (Osborne et al., 2008). Therefore, it is important to have an increased focus on individualized, evidence-based, family-centric feeding interventions.

Caregiver-mediated approaches focusing on dyadic engagement are increasingly used in early intervention, especially for autistic children (Lord et al., 2022). In these approaches, caregivers are coached to provide intervention for their children under the supervision of a trained therapist (Althoff et al., 2019). Caregiver-mediated approaches may involve a training component alongside parent coaching to optimize child learning during naturally occurring routines during daily life at home and in the community (Grofer Klinger et al., 2013).

Caregiver-mediated approaches have been successfully used to support autistic children with conduct issues (Sanders et al., 2000), toileting difficulties (Stark et al., 1990) and anxiety (Creswell & Cartwright-Hatton, 2007). To date, however, there has been little investigation of caregiver-mediated approaches in the family's natural context for feeding therapy in the early childhood years.

Current feeding therapies tend to be delivered and led by therapists in various settings such as outpatient clinics, hospitals, schools, and the family's home. These services are often expensive or dependent on external funding and may include transportation barriers, especially for families living in regional areas vs metropolitan centers (Chiri & Warfield, 2012). Criticisms of the existing primary literature to date include the inconsistency between the intention of the feeding program and the measured outcome, as well as the absence of long-term follow-up (Marshall et al., 2015). Further, compared with other pediatric therapies, there is a significant shortage of trained feeding therapists, especially those working in rural and remote areas (Silverman, 2010). It is crucial, therefore, to develop and evaluate alternative feeding interventions to provide greater access to care (Fleet et al., 2022). Telehealth rehabilitation for feeding difficulties may provide an alternate and necessary pathway to increasing access to high-quality pediatric services, including feeding therapies, to families with traditionally poor access (Hsu et al., 2021). Telehealth also provides an opportunity for therapists to use a caregiver-mediated approach by acting as a coach to support caregivers in utilizing naturally occurring opportunities at home to achieve their family goals (Hsu et al., 2021).

The Engaged Eaters Program (EEP) is a novel family-engaged, caregiver-mediated eating and mealtime intervention developed for families with autistic children with feeding difficulties aged two to seven years. EEP uses a combination of direct therapist-led intervention, parent training and coaching to address individualized family feeding goals (Ausderau et al., 2021).

The EEP intervention includes 24 weekly sessions, and eight caregiver training modules delivered by trained practitioners. Caregiver training modules cover eight eating and mealtime-specific topics such as setting family goals, understanding sensory responses, developing feeding skills and understanding challenging mealtime behaviors and child health and nutrition. Using a caregiver-mediated approach, the EEP was designed to be delivered in-home and embedded in the family's natural mealtime context. In response to the COVID-19 pandemic, however, the EEP-In-home intervention was adapted to EEP-Telehealth (Hladik et al., 2023).

A quasi-experimental pretest-posttest study involving 14 mothers in a 6-month, in-home *via* telehealth EEP intervention for autistic children aged 2 to 7 years evaluated the relationship between children's feeding challenges and caregiver outcomes such as stress, self-efficacy, confidence and positive feeding responses (St. John & Ausderau, 2024). Results identified that children's feeding difficulties were not significantly related to any caregiver outcomes, indicating there may be a lack of significant relationship between the severity of feeding difficulties at intake and the change in severity of feeding difficulties and caregiver outcomes. Another qualitative study involved 13 mothers of autistic children aged 2 to 7 years, focused on understanding caregivers' experience of participating in an in-home EEP intervention (Hladik et al., 2025). The findings emphasized the advantages of EEP being integrated into caregivers' home environment, and

the improvement of their knowledge and skills. Participating mothers also reported having more practical skills and resources that they could readily practice at home, which boosted their self-efficacy and confidence in feeding their kids. The mean age of children in both these studies were 58 and 59 months respectively. Results from these pilot studies of EEP suggest the feasibility and primary efficacy (Hladik et al., 2025; St. John & Ausderau, 2024); however, the effectiveness of the EEP has yet to be assessed for very young children. The previous studies did not have a sole focus on children under 30 months of age as they have different developmental needs as compared to seven year olds in the previous studies. In discussion with the original EEP developers, it was determined that a more focused approach would be valuable and worth investigating. It is critical to identify and disseminate evidence-based interventions in the early years that may mitigate the long-term impacts of persistent feeding difficulties (Sharp et al., 2013).

The aim of the current study was to examine the feasibility and impact of the EEP delivered *via* telehealth for a young Autistic toddler (EEP-Early Development (ED)-Telehealth) assessing parent satisfaction, telehealth delivery mode, family-centric feeding goals, parental stress and perceived competence to improve his feeding outcomes, including his mealtime behaviors and increasing his food repertoire and equipping caregivers with strategies to manage challenging behaviors.

Method

Study Design

This descriptive clinical case study included three phases—baseline, intervention and follow-up. The study was approved by the La Trobe University Human Research Ethics Committee (Ref: HEC22076). The research was conducted between September 2022 and February 2023.

Participant

One caregiver-child dyad completed the study. They were recruited from a local child-care center in a large metropolitan city. The child, Hayden (pseudonym), was a 28-month-old Autistic male with feeding difficulties. He lived with his married parents and six-year-old brother, who were all of Chinese ethnicity. His mother had a post-graduate degree and worked part-time. His father had a bachelor's degree and worked full-time. Both parents were in professional employment.

Early History

Hayden was reportedly born at full-term with no perinatal complications, weighing 3.48 kilograms. He was bottle-fed as a baby and had early difficulties, including frequent gagging, crying, arching, vomiting and often trying to push the bottle away. Hayden was fully transitioned to table foods between 18 and 24 months. This was reportedly a difficult transition as Hayden had difficulty chewing different textured foods and relied on his mother to feed him. At 18 months of age, Hayden was diagnosed with Autism

Spectrum Disorder Level 3 (requiring very substantial support), and during the current study period, he attended an early intervention program where he received daily educational therapies and weekly occupational and speech therapy (neither of which targeted feeding). Hayden could speak one to two words in a phrase sentence, for e.g. bikkies, please. He could nod his head appropriately to yes or no questions. He loved playing with his elder brother at home. However, his mother reported Hayden engaging in parallel play at childcare. Hayden's favorite toys were train sets and stacking games. Hayden had a small attention span of five to 10 min per activity, depending on his interest levels. It would generally take 30–45 min to feed Hayden during dinner time. Hayden had no other identified neurodevelopmental, visual, hearing, physical or genetic condition that might have impacted his feeding development.

Study Procedure

After obtaining informed consent, Hayden and his mother participated in a baseline session that included an overview of the program, a parent interview to co-develop feeding goals using Goal Attainment Scaling (GAS) (King et al., 2000) and a filmed observation of family mealtime. His mother completed standardized questionnaires at baseline and following the completion of the EEP—ED – Telehealth program (follow-up). The study procedure is outlined in Figure 1.

Intervention

The EEP-ED-Telehealth was developed in consultation with the EEP developers to be suitable for toddlers (i.e. ages 12 to 30 months). Adaptations included session length reduced to 30 min (from 60 min) and the frequency of delivery increased to twice rather than once weekly to accommodate the attention span and better align with the

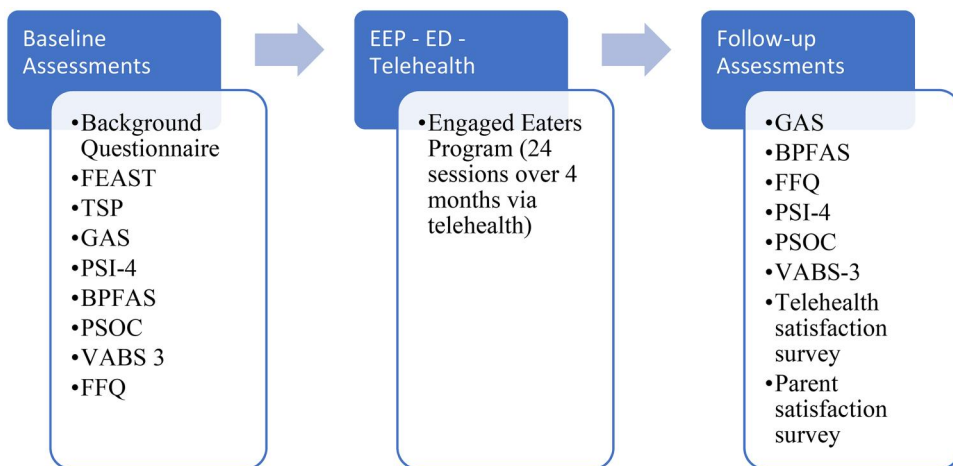


Figure 1. Study procedure.

Note. GAS: Goal Attainment Scaling, PSI-4: Parenting Stress Index (short form)-4, PSOC: Parenting Sense of Competence Scale TSP: Toddler Sensory Profile, VABS-3: Vineland Adaptive behavior Scale-3, FFQ: Food Frequency Questionnaire, FEAST: Feeding and Eating in Autism Together survey, BPFAS: Behavioral Pediatric Feeding Assessment Scale.

household routines of a toddler-aged child. The 24 feeding intervention sessions were, therefore, delivered twice weekly over a four-month period. Sessions followed a structured session rhythm of a brief check-in, a warm-up activity, a primary intervention activity, a cooldown or wrap-up, and a selection of the strategies to be implemented by caregivers during the following week. The occupational therapist used a combination of direct intervention, caregiver coaching and training, and virtual modeling techniques to address individualized child needs.

The EEP-ED-Telehealth was delivered by the first author (AM), a registered occupational therapist with over ten years of clinical experience working with autistic children and children with feeding difficulties. AM completed eight hours of training on the EEP program with its developers prior to commencing this study. Thereafter, 20% of the recorded sessions were reviewed by a member of the EEP development team (BSJ) at the end of the program to monitor program fidelity. Sessions were evaluated for fidelity using the EEP fidelity checklist (Ausderau, K., personal communication, March 2023). No modifications to the checklist were necessary for the EEP-ED-Telehealth (mainly because the session length or frequency is not reflected in the fidelity items).

All the sessions were delivered *via* telehealth in the participating family's own home environment. Telehealth delivery was *via* Zoom™ video conferencing software with sessions recorded for data collection, session review and fidelity assessment. Hayden and his mother attended all sessions, with his elder brother also sometimes present in the living room. Intervention sessions occurred at his dinner time. The first six intervention sessions were at a small table in the living room while his mother fed him (where Hayden would eat while playing with toys). Subsequently, his mother moved him to the family dinner table, where all the intervention sessions were conducted. Hayden sat with his brother and his mother at the family dinner table. His parents always modeled appropriate mealtime behaviors. Hayden enjoyed looking at his brother while he tried different food items, and at times, Hayden would ask for some of the food items to try.

Measures

Baseline Characterization Measures

Background Information Questionnaire

A customized background questionnaire delivered *via* REDCap captured demographic data for the child and parent: child's date of birth, current height and weight, medical conditions, therapies received, annual household income, education level and occupation.

Feeding and Eating in AutiSm Together Questionnaire (FEAST)

Ausderau et al. (2021) developed the FEAST feeding questionnaire to support their examination of the effectiveness of the original EEP with Autistic children (Ausderau, Unpublished manual). A 77-item adaptation was created for the current study, modified to be suitable for Australian toddlers delivered *via* REDCap. This questionnaire collected family information about mealtime routine and structure (25 questions); child self-help skills (4 questions); child health (8 questions) and child's oral-motor abilities

(1 question); child behavior around mealtimes (17 questions); early feeding history (8 questions) and information about diet, sleep, food allergies and medications (3 questions) and sensory processing (11 questions). Fifty-one questions were rated on a six-point Likert-type scale (from not applicable to almost always applicable), fourteen as 'yes' or 'no' and sixteen as multiple-choice questions. The FEAST has demonstrated construct validity for the measurement of four underlying constructs (Sensory, Behavior, Oral Motor, and Gastrointestinal) contributing to feeding challenges (Ausderau, Unpublished manual). Here, the FEAST was used to gather information related to Hayden's early and current feeding challenges.

Toddler Sensory Profile – 2 (TSP-2)

The TSP-2 is a norm reference measure of sensory processing patterns in children aged 7 to 35 months (Dunn, 2014). Parents respond to 54 items – e.g. 'my child prefers one texture of food' and 'my child is fussy or irritable' on a 6-point Likert-type scale (almost, always, frequently, half the time, occasionally, almost never, does not apply). Items combined across four subdomains – registration, sensitivity, seeking, and avoiding – and individual child's scores can be compared to those from age-matched peers. Here, the TSP-2 was used to characterize how Hayden processes sensory information relative to his peers.

Outcome Measures (Primary and Secondary Outcomes)

Goal Attainment Scale (GAS)

GAS is an individualized outcome measure that calculates the extent to which a client's goals are met (King et al., 2000). The goals were set collaboratively related to Hayden's family mealtime behaviors prior to the start of the intervention. Each goal was rated both at the start and then again at the end of the intervention on a 5-point Likert scale (-2, much less than expected; -1, somewhat less than expected; 0 as expected; +1, somewhat more than expected and +2, much more than expected).

Parenting Stress Index-4-Short Form (PSI-4)

The PSI-4 is a self-report questionnaire completed by parents of children aged between 1 month and 12 years (Zaidman-Zait et al., 2010). The 36-item inventory focuses on three major domains of stress – parental distress, parent-child dysfunctional interaction, and difficult child which combine for a Total Stress Scale. Parents rate items on a 5-point Likert scale from *strongly disagree* to *strongly agree*, such that higher domain and Total Stress scores indicate increased levels of parenting stress. The PSI-SF was used to measure perceived self-reported caregiver stress pre- and post-participation in the EEP.

The Behavioral Pediatrics Feeding Assessment Scale (BPFAS)

The BPFAS is a widely used parent-report measure of mealtime and feeding behavior (Crist & Napier-Phillips, 2001) and is considered a robust tool for screening feeding difficulties. It is a 35-item scale, with 25 questions about child behavior and ten questions about parent feelings and strategies regarding mealtime and feeding problems. In each case, parents rate the frequency of the specific behaviors on a 5-point Likert scale and

provide a dichotomous yes/no answer about whether they consider that behavior is a problem. Four scores are then calculable: two pertaining to the child's behaviors; and two to the strategies used by the parent during mealtimes. In each case, a higher score indicates increased challenging mealtime and feeding behaviors.

Parenting Sense of Competence Scale (PSOC)

The PSOC is a self-report measure of parent self-efficacy (Johnston & Mash, 1989). The 17 items span two sub-scales measuring parenting satisfaction and parenting self-efficacy. Each item is answered on a 6-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree). Nine items are reverse coded during scoring such that a higher overall score indicates a higher parenting sense of competency. Scores range plausibly from 1 to 102, and a score of 68 or above coincides with an average item rating at or above '4: agree' on the Likert scale. Here, the PSOC was used to assess the change in Hayden's mother's parental competency pre-and post-intervention.

Vineland Adaptive Behavior Scales-3 (VABS-3)

The VABS-3 measures adaptive behavior across the lifespan from birth to 90 years (Pepperdine & McCrimmon, 2018). For the current study, we used the online Parent/Caregiver Rating Form. It also aids in diagnosing intellectual and developmental disabilities and autism. The VABS-3 items assess adaptive behavior across the following domains: communication, daily living skills, socialization, motor skills, as well as maladaptive behaviors; and an overall Adaptive Behavior Composite (ABC) standard score is calculated from the four primary skill domains.

Food Frequency Questionnaire (FFQ)

The 98-item FFQ is a limited checklist of foods and beverages, and caregivers are asked to report the portion size and how frequently each item has been consumed by their child over a specific period of time (Watson, 2012). Hayden's parents were asked to report his food intake on a typical day, with all food portion estimates given in natural portion sizes (e.g. 'number of crackers') and any foods without a 'natural' portion size given in terms of child's palm volume (e.g. 'number of palms' of rice eaten). The FFQ is reported to have high test-retest reliability and has adequate to good concurrent construct validity when compared to a five-day weighted diet record (Watson, 2012). Here, the FFQ provided a sample of Hayden's dietary variety pre-and post-intervention.

Feasibility Measures

Intervention Fidelity Checklist

A Fidelity Checklist developed for the original EEP was used for the EEP—ED—Telehealth (Ausderau, K., personal communication, March 2023). An independent observer experienced in the delivery of EEP (BSJ) examined a random sample of video-recorded therapy sessions against the Fidelity Checklist rating the interventionist's adherence to each of the session's activities on a scale of 0 to 2 (0 = did not implement; 1 = partially implemented, 2 = implemented; and NA = not applicable). Fidelity to the

EEP-ED-Telehealth delivery principles was then expressed as a proportionate score (i.e. scores of 2 on all goals for a given session equating to 100% fidelity for that session).

The Parent Satisfaction Questionnaire (PSQ)

The PSQ was adapted for the current study using the satisfaction questionnaire (Research Units on Pediatric Psychopharmacology Autism, 2007). The parent was asked to rate their satisfaction with the EEP—ED – Telehealth program on nine items, including the number of sessions, the usefulness of teaching tools (e.g. caregiver training modules), and the perceived helpfulness of specific session topics. The parent completed the PSQ *via* a REDCap survey at the end of the intervention. All of the items were scored on a 3-point Likert Scale (0 = not satisfied, 1 = partly satisfied, 2 = satisfied), with higher scores reflecting greater levels of satisfaction.

Telehealth Satisfaction Survey

A Telehealth Satisfaction Survey was created for the current study, adapted from the Telehealth Satisfaction Survey (Morgan et al., 2014). The parent was asked to rate their satisfaction with telehealth delivery in terms of communication and parent/child participation across nine items using a 3-point Likert scale (1 = satisfied, 2 = partly satisfied, 0 = not satisfied) *via* REDCap. Higher ratings represent greater satisfaction.

Outcomes

Baseline Characterization

At baseline, Hayden's mother and his brother typically ate together at the dinner table with an expectation that everyone would eat the same meal. Due to Hayden's father's work schedule, he occasionally joined them at dinner on weekdays. As Hayden would not stay at the table for more than 10 min, his mother fed him at a small table in their living room before other family members would eat their dinner. Hayden's favorite foods were plain noodles and porridge. Hayden's diet also consisted of large quantities of milk. During the filmed observation of family mealtime, Hayden was in a highchair with his feet unsupported for his dinners with his favorite toys on the table. He disliked textured foods and had a strong preference for soft foods. His mother was mashing most foods or cooking them until they were soft. Hayden was reported to seek and register sensory experiences to the same extent as his peers. However, he was more likely to be overwhelmed by and sensitive to sensory cues.

Primary Outcomes

Table 1 summarizes the feeding goals set for Hayden by his mother at baseline and her ratings for each goal provided at baseline and follow-up.

As can be seen, all family mealtime goals were met. Hayden moved from being fed 100% of the time at baseline to self-feeding 75% of the time at follow-up. While he was drinking from a training cup at baseline, at follow-up, he was drinking from a small open cup. Further, Hayden progressed from eating soft foods only at baseline to eating differently textured foods at follow-up. Hayden was eating textures such as crackers,

Table 1. Feeding goal attainment.

Goal Attainment Scale	Baseline	Follow-up
Goal 1: Hayden will feed himself using cutlery at dinner time 50% of the time by the end of 24 sessions with verbal and physical prompts.	-1 (less than expected) Hayden's mother was feeding him 100% of the time at dinner.	+1 (somewhat more than expected) Hayden was feeding himself 75% of the time at dinner with occasional verbal prompts.
Goal 2: Hayden will be independently able to drink water from a small glass by the end of 24 sessions.	-1 (less than expected) Hayden drank from a training cup.	+2 (much more than expected) Hayden was drinking independently from an open cup.
Goal 3: Hayden will try (touch, lick, taste) at least five different textured foods by the end of 24 sessions.	-1 (less than expected) Hayden was only eating soft mushy foods (with the exception of cookies).	+2 (much more than expected) Hayden was trying more than 15 different textured foods 100% of the time.

Table 2. Secondary outcomes.

Assessments	Pre-intervention	Post-intervention
Parenting Stress Index (PSI-SF) – 4	Raw score: 118 94 percentiles	Raw score:112 86 percentiles
Behavioral Pediatric Feeding Assessment Scale	Problem score: 21 Frequency score:110	Problem score: 16 Frequency score: 85
Parenting Sense of Competence	52	55
Vineland Adaptive Behavior Scale-3	61 (Percentile rank <1)	68 (Percentile rank: 2)
<ul style="list-style-type: none"> • Adaptive Behavior Composite (ABC): 45 (Percentile rank <1) • Daily Living Skills (standard score): 		68 (Percentile rank: 2)

cheese sticks, vegemite sandwiches and pears and also some bright colored foods such as blueberries and strawberries post-intervention. The serving sizes were small initially as he was trying these new foods.

Secondary Outcomes

Baseline and follow-up scores for all other outcomes are reported in Table 2. As can be seen, parental stress and frequency of problematic behaviors at mealtime had decreased at follow-up. As per the BPFAS, post-intervention, Hayden's mother reported feeling confident in managing challenging behaviors at mealtimes. Also, Hayden demonstrated decreased challenging feeding behaviors such as being able to sit at the family dinner table and trying new foods. Hayden's mother also felt more competent in parenting post-intervention. Adaptive behavior, particularly in the area of daily living skills, was also increased post-intervention; however, still significantly below the normative mean of 100 (the normative standard deviation is 15).

At baseline, Hayden had eight food items in his repertoire. Based on the FFQ and BPFAS, Hayden demonstrated an increase in the number of foods he accepted post-intervention, adding 14 new foods (a total of 22 food items). This was accompanied by a decrease in Hayden's milk intake and was consistent with his family's changes regarding the food they provided to him. His mother reported having a lot more options for his daycare lunch box.

Feasibility Measures

Hayden and his mother attended all intervention sessions. The average intervention fidelity score was 92.5% (range from 90 to 100%). The caregiver rated all the questions

on the parent satisfaction survey as ‘satisfied’ and also answered ‘yes’ to the question, ‘Would you recommend the Engaged Eaters Program to other caregivers?’. Hayden’s mother rated the questions regarding their telehealth experience with the maximum score of ‘satisfied’. She reported that it was convenient to use telehealth as they have a busy lifestyle as working parents.

Discussion

The aim of this study was to examine the feasibility and impact of the EEP-ED-Telehealth for an autistic toddler with feeding difficulties. At the end of the intervention, family-centric feeding goals were exceeded, including the attainment of independent drinking and eating and an increase in the child’s dietary repertoire. In addition to increasing Hayden’s food repertoire, his mother also reported a decrease in challenging mealtime behaviors. Further, the parent reported satisfaction with the intervention and the telehealth delivery mode. As such, this study provides the first evidence of the feasibility and effectiveness of the EEP-ED-Telehealth for autistic toddlers with feeding difficulties.

Support for the feasibility of the EEP-ED-Telehealth includes 100% attendance with all sessions and completion of all outcome measures by the parent. Furthermore, the self-reported satisfaction rating was high for the participating mother, both for the implementation of the program and the telehealth delivery. As evidence of parent satisfaction, parents reported that they would recommend the program to others and felt more confident in their ability to manage difficult mealtime behaviors. These results are consistent with other caregiver-mediated feeding interventions in regard to high attendance and low attrition rates (Caldwell et al., 2020; Cosby & Muldoon, 2017; Johnson et al., 2019; Pickard et al., 2023). Furthermore, our study supports the feasibility of EEP-ED *via* telehealth. This may open avenues to deliver specialized feeding services for people living in rural and remote areas with limited access to allied health.

The findings of this study reinforce the growing body of evidence that caregiver-mediated approaches promote behavioral and health outcomes during early childhood (Aponte et al., 2019). The results of this clinical case study provide preliminary evidence that coaching and empowering caregivers to apply strategies around challenging mealtime behaviors is feasible and beneficial in managing feeding difficulties and achieving family mealtime goals. Our clinical case study also supports findings from the literature that caregiver-mediated interventions may be one way of improving a child’s feeding skills, dietary variety and family mealtime routines in the natural context of a child’s home (Ausderau et al., 2021; Caldwell et al., 2020). The findings of this study support the idea that intervention in early childhood can successfully address feeding goals.

Clinic-based interventions may not translate to home context and family routines as compared to in-home intervention approaches. Parents may find the clinic-based intervention less feasible if they have difficulty translating it to their own homes (Aponte et al., 2019). A scoping review by Aponte et al. (2019) included 26 studies utilizing parent training for feeding difficulties in autistic children. All of the studies except one were conducted in clinic or school settings, and only a small portion of the intervention was conducted at home (Aponte et al., 2019). In contrast, the EEP-ED-Telehealth was

undertaken entirely at home, and this may be one of the reasons for higher parent satisfaction. When the emphasis is placed on integrating the intervention into the family's natural context, it ensures social validity (Ausderau et al., 2021). Further, the family actively chose the goals that were most meaningful for their family. This may have increased their investment in the program and consistently incorporated strategies into their family routines. Moreover, as the program was delivered *via* telehealth, it reduced the need for a clinic-to-home skill generalization (Hsu et al., 2021).

Caregivers' experience engaging in EEP-ED-Telehealth in this study was consistent with the results from Occupational Performance Coaching (OPC) *via* telehealth studies (Graham et al., 2010, 2014). These studies also found that caregivers felt empowered with coaching, experienced collaborative relationships with their coach, and were active in implementing the strategies they learnt. The present study showed that EEP—ED – Telehealth may be effective in autistic toddlers by modifying the intervention session frequency and duration and supporting parents in learning different strategies for increasing dietary repertoire and decreasing challenging mealtime behaviors.

Study Limitations, Future Directions and Conclusion

Limitations of this study include single-subject clinical case study design and lack of heterogeneity. Findings from our study cannot be generalized beyond the single participant. However, we were able to support the feasibility of the EEP-ED-Telehealth. Another acknowledged limitation of our study is the time commitment needed for the intervention sessions, which may not always be feasible for parents with busy lifestyles. Also, our findings are based only on 24 sessions with no follow-up. Therefore, we do not know whether the changes were sustained over time. With the findings of this pilot study, future research should be directed toward undertaking a larger trial to evaluate the efficacy of the EEP-ED-Telehealth for toddlers with autism. The larger sample size would also benefit from more attention to the recruitment of a sample with diverse ethnic backgrounds and a closer examination of caregiver-child factors such as temperament and caregiver-child interactions known to impact feeding behaviors in Autistic and non-autistic children.

In conclusion, at the end of the EEP-ED-Telehealth, family-centric feeding goals were achieved, including the attainment of independent drinking and eating and increasing the child's dietary repertoire by 14 new foods. Our rich data over 24 sessions allowed us to evaluate caregivers' ability to implement learned strategies in their natural context. Our study also supported the premise that empowering caregivers to be the agents of change may be a promising method to promote positive mealtime experiences.

Acknowledgements

We would like to thank A/Prof Karla Ausderau for her time and knowledge in training the interventionist in the Engaged Eaters Program. We would also like to thank the family who participated in the research.

Author contributions

CRedit: **Asmita Mudholkar**: Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing; **Brittany St John**: Methodology, Writing – review & editing; **Larissa Korostenski**: Supervision; **Kristelle Hudry**: Methodology, Supervision, Writing – review & editing; **Alison E. Lane**: Conceptualization, Methodology, Supervision, Writing – review & editing.

Disclosure Statement

The authors report there are no competing interests to declare.

Funding

The author(s) reported there is no funding associated with the work featured in this article.

About the Authors

Asmita Mudholkar is an occupational therapist and works as a Senior Lecturer in occupational therapy at La Trobe Rural Health School. She has practiced as an Occupational Therapist in Australia and the United States of America. She has worked both in the public and private health sectors. Her clinical experience is comprised of pediatrics, rehabilitation, rural generalist and clinical education. She is passionate about pediatric occupational therapy and, rural and remote health care. She is highly motivated to provide high-quality student learning and teaching experience.

Brittany St John is an Assistant Professor in the Division of Occupational Therapy within the Department of Rehabilitation Medicine at the University of Washington. She has a PhD in kinesiology: occupational science, a master's in public health, and a licensed pediatric occupational therapist. Her research expertise is feeding challenges in autistic children, caregiver-mediated intervention approaches, and health promotion for individuals with intellectual and developmental disabilities.

Larissa Korostenski is a neonatologist and head of newborn services at John Hunter Hospital. She is actively involved in the coordination and delivery of developmental services to infants born at high risk across the Hunter Health District.

Kristelle Hudry is Associate Professor with the Department of Psychology, Counselling and Therapy, School of Psychology and Public Health, La Trobe University. She is a developmental and autism scientist and leads the Childhood Autism and Parenting Team (CAPTeam), a cross-unit—Psychology, Speech Pathology—group of formally-trained and trainee researchers, including members with relevant lived-experience. She and the CAPTeam lead research and collaborate with national and international partners on range of topics broadly focused on development from birth through the school years, including as relevant to autism and other neurodiversity.

Alison E. Lane is the Director of the Olga Tennison Autism Research Centre (OTARC). She is an occupational therapist and internationally recognized for her scholarship regarding sensory processing challenges in children, particularly as they relate to functioning in autistic individuals. She is the first or senior author on several seminal papers in the field including two that have been cited globally more than 400 times each. Her work is grounded in 30 years' experience in pediatric clinical practice, health service management, research and teaching. She obtained a B Occupational Therapy (Hons) and PhD (Occupational Therapy) from the University of Queensland, Australia. She sustained a full-time clinical and clinical management career in pediatric occupational therapy for 13 years, providing leadership for occupational therapy services at tertiary level pediatric centers including the Royal Children's Hospital, Queensland and The Children's Hospital in Denver, Colorado.

ORCID

Asmita Mudholkar  <http://orcid.org/0000-0002-2646-7536>
 Brittany St John  <http://orcid.org/0000-0002-2910-0326>
 Larissa Korostenski  <http://orcid.org/0000-0002-1203-8271>
 Kristelle Hudry  <http://orcid.org/0000-0002-2752-8345>
 Alison E. Lane  <http://orcid.org/0000-0003-0378-9716>

References

- Althoff, C. E., Dammann, C. P., Hope, S. J., & Ausderau, K. K. (2019). Parent-mediated interventions for children with autism spectrum disorder: A systematic review. *American Journal of Occupational Therapy*, 73(3), 7303205010p1–7303205010p13. <https://doi.org/10.5014/ajot.2019.030015>
- Aponte, C. A., Brown, K. A., Turner, K., Smith, T., & Johnson, C. (2019). Parent training for feeding problems in children with autism spectrum disorder: A review of the literature. *Children's Health Care*, 48(2), 191–214. <https://doi.org/10.1080/02739615.2018.1510329>
- Ashley, K., Steinfeld, M. B., Young, G. S., & Ozonoff, S. (2020). Onset, trajectory, and pattern of feeding difficulties in toddlers later diagnosed with autism. *Journal of Developmental and Behavioral Pediatrics: JDBP*, 41(3), 165–171. <https://doi.org/10.1097/DBP.0000000000000757>
- Ausderau. (Unpublished manual). *Feeding and Eating in Autism Together (FEAST) Assessment*. University of Wisconsin – Madison.
- Ausderau, K., St John, B., Hladik, L., Kant, S., Muesbeck, J., & Romaniak, H. (2021). Feasibility and effectiveness of a parent-mediated in-home feeding intervention for families with children with autism spectrum disorder. *American Journal of Occupational Therapy*, 75(Supplement_2), 7512505149p1–7512505149p1. <https://doi.org/10.5014/ajot.2021.75S2-RP149>
- Burkett, K., Haggard, M.-L., Van Rafelghem, D., & Harpster, K. (2022). Restricted eating in preschoolers with autism: Mother stressors and solutions. *Journal of Autism and Developmental Disorders*, 52(6), 2589–2597. <https://doi.org/10.1007/s10803-021-05078-6>
- Bury, S. M., Jellett, R., Spoor, J. R., & Hedley, D. (2023). “It defines who I am” or “it’s something I have”: What language do [autistic] Australian adults [on the autism spectrum] prefer? *Journal of Autism and Developmental Disorders*, 53(2), 677–687. <https://doi.org/10.1007/s10803-020-04425-3>
- Caldwell, A. R., Skidmore, E. R., Bendixen, R. M., & Terhorst, L. (2020). Examining child mealtime behavior as parents are coached to implement the Mealtime PREP intervention in the home: Findings from a pilot study. *British Journal of Occupational Therapy*, 83(10), 631–637. <https://doi.org/10.1177/0308022620920086>
- Chiri, G., & Warfield, M. E. (2012). Unmet need and problems accessing core health care services for children with autism spectrum disorder. *Maternal and Child Health Journal*, 16(5), 1081–1091. <https://doi.org/10.1007/s10995-011-0833-6>
- Cosbey, J., & Muldoon, D. (2017). EAT-UP™ family-centered feeding intervention to promote food acceptance and decrease challenging behaviors: A single-case experimental design replicated across three families of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 47(3), 564–578. <https://doi.org/10.1007/s10803-016-2977-0>
- Creswell, C., & Cartwright-Hatton, S. (2007). Family treatment of child anxiety: Outcomes, limitations and future directions. *Clinical Child and Family Psychology Review*, 10(3), 232–252. <https://doi.org/10.1007/s10567-007-0019-3>
- Crist, W., & Napier-Phillips, A. (2001). Mealtime behaviors of young children: A comparison of normative and clinical data. *Journal of Developmental and Behavioral Pediatrics: JDBP*, 22(5), 279–286. <https://doi.org/10.1097/00004703-200110000-00001>

- Demir, A. Ç., & Özcan, Ö. (2022). The nutritional behavior of children with autism spectrum disorder, parental feeding styles, and anthropometric measurements. *Nordic Journal of Psychiatry*, 76(1), 64–70. <https://doi.org/10.1080/08039488.2021.1934109>
- Dunn, W. (2014). *Sensory profile 2 manual*. Pearson.
- Enea, V., & Rusu, D. M. (2020). Raising a child with autism spectrum disorder: A systematic review of the literature investigating parenting stress. *Journal of Mental Health Research in Intellectual Disabilities*, 13(4), 283–321. <https://doi.org/10.1080/19315864.2020.1822962>
- Fleet, S. E., Davidson, R. D., Carr, K., Lubenow, C., Rouse, A. S., & Truscott, K. E. (2022). Conversion of a traditional in-person feeding clinic to a telehealth-only model of care. *Maternal and Child Health Journal*, 26(1), 58–64. <https://doi.org/10.1007/s10995-021-03316-y>
- Graham, F., Rodger, S., & Ziviani, J. (2010). Enabling occupational performance of children through coaching parents: Three case reports. *Physical & Occupational Therapy in Pediatrics*, 30(1), 4–15. <https://doi.org/10.3109/01942630903337536>
- Graham, F., Rodger, S., & Ziviani, J. (2014). Mothers' experiences of engaging in occupational performance coaching. *British Journal of Occupational Therapy*, 77(4), 189–197. <https://doi.org/10.4276/030802214X13968769798791>
- Grofer Klinger, L., Ence, W., & Meyer, A. (2013). Caregiver-mediated approaches to managing challenging behaviors in children with autism spectrum disorder. *Dialogues in Clinical Neuroscience*, 15(2), 225–233. <https://doi.org/10.31887/DCNS.2013.15.2/lklinger>
- Hladik, L., St. John, B., Carbery, M., Gray, M., Drew, J. R., & Ausderau, K. K. (2023). Benefits and challenges of a telehealth eating and mealtime intervention for autistic children: Occupational therapy practitioners' perspectives. *OTJR: Occupation, Participation and Health*, 43(3), 540–548. <https://doi.org/10.1177/15394492231175069>
- Hladik, L., St. John, B. M., Korbel, A., Nelson, N., Umana, M., Kant, S., & Ausderau, K. K. (2025). “Giving me the self-confidence to tackle it”: Mothers' experiences participating in the engaged eaters program, a caregiver-mediated feeding intervention. *Journal of Autism and Developmental Disorders*, 55(3), 1045–1056. <https://doi.org/10.1007/s10803-024-06250-4>
- Hsu, N., Monasterio, E., & Rolin, O. (2021). Telehealth in pediatric rehabilitation. *Physical Medicine and Rehabilitation Clinics of North America*, 32(2), 307–317. <https://doi.org/10.1016/j.pmr.2020.12.010>
- Johnson, C. R., Brown, K., Hyman, S. L., Brooks, M. M., Aponte, C., Levato, L., Schmidt, B., Evans, V., Huo, Z., Bendixen, R., Eng, H., Sax, T., & Smith, T. (2019). Parent training for feeding problems in children with autism spectrum disorder: Initial randomized trial. *Journal of Pediatric Psychology*, 44(2), 164–175. <https://doi.org/10.1093/jpepsy/jsy063>
- Johnston, C., & Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, 18(2), 167–175. https://doi.org/10.1207/s15374424jccp1802_8
- Kenny, L., Hattersley, C., Molins, B., Buckley, C., Povey, C., & Pellicano, E. (2016). Which terms should be used to describe autism? Perspectives from the UK autism community. *Autism*, 20(4), 442–462. <https://doi.org/10.1177/1362361315588200>
- King, G. A., McDougall, J., Palisano, R. J., Gritzan, J., & Tucker, M. A. (2000). Goal attainment scaling: Its use in evaluating pediatric therapy programs. *Physical & Occupational Therapy In Pediatrics*, 19(2), 31–52. https://doi.org/10.1080/J006v19n02_03
- Leader, G., Tuohy, E., Chen, J. L., Mannion, A., & Gilroy, S. P. (2020). Feeding problems, gastrointestinal symptoms, challenging behavior and sensory issues in children and adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 50(4), 1401–1410. <https://doi.org/10.1007/s10803-019-04357-7>
- Ledford, J. R., & Gast, D. L. (2006). Feeding problems in children with autism spectrum disorders: A review. *Focus on Autism and Other Developmental Disabilities*, 21(3), 153–166. <https://doi.org/10.1177/10883576060210030401>
- Lei, J., Jones, L., & Brosnan, M. (2021). Exploring an e-learning community's response to the language and terminology use in autism from two massive open online courses on autism education and technology use. *Autism*, 25(5), 1349–1367. <https://doi.org/10.1177/1362361320987963>
- Lord, C., Charman, T., Havdahl, A., Carbone, P., Anagnostou, E., Boyd, B., Carr, T., de Vries, P. J., Dissanayake, C., Divan, G., Freitag, C. M., Gotelli, M. M., Kasari, C., Knapp, M., Mundy,

- P., Plank, A., Scahill, L., Servili, C., Shattuck, P., ... McCauley, J. B. (2022). The Lancet Commission on the future of care and clinical research in autism. *Lancet (London, England)*, 399(10321), 271–334. [https://doi.org/10.1016/S0140-6736\(21\)01541-5](https://doi.org/10.1016/S0140-6736(21)01541-5)
- Marshall, J., Ware, R., Ziviani, J., Hill, R. J., & Dodrill, P. (2015). Efficacy of interventions to improve feeding difficulties in children with autism spectrum disorders: A systematic review and meta-analysis. *Child: Care, Health and Development*, 41(2), 278–302. <https://doi.org/10.1111/cch.12157>
- Mayes, S. D., & Zickgraf, H. (2019). Atypical eating behaviors in children and adolescents with autism, ADHD, other disorders, and typical development. *Research in Autism Spectrum Disorders*, 64, 76–83. <https://doi.org/10.1016/j.rasd.2019.04.002>
- Morgan, D. G., Kosteniuk, J., Stewart, N., O'Connell, M. E., Karunanayake, C., & Beever, R. (2014). The Telehealth Satisfaction Scale (TeSS): Reliability, validity, and satisfaction with telehealth in a rural memory clinic population. *Telemedicine Journal and e-Health: The Official Journal of the American Telemedicine Association*, 20(11), 997–1003. <https://doi.org/10.1089/tmj.2014.0002>
- Osborne, L. A., McHugh, L., Saunders, J., & Reed, P. (2008). Parenting stress reduces the effectiveness of early teaching interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, 38(6), 1092–1103. <https://doi.org/10.1007/s10803-007-0497-7>
- Pepperdine, C. R., & McCrimmon, A. W. (2018). Test review: Vineland Adaptive Behavior Scales, Third Edition (Vineland-3) by Sparrow, S. S., Cicchetti, D. V., & Saulnier, C. A. *Canadian Journal of School Psychology*, 33(2), 157–163. <https://doi.org/10.1177/0829573517733845>
- Pickard, K., Burrell, T. L., Brasher, S., Buckley, D., Gillespie, S., Sharp, W., & Scahill, L. (2023). Examining adaptations necessary to support the implementation of a parent-mediated intervention for children with autism spectrum disorder and moderate feeding problems. *Autism: The International Journal of Research and Practice*, 27(8), 2434–2445. <https://doi.org/10.1177/13623613231166181>
- Research Units on Pediatric Psychopharmacology Autism. (2007). Parent training for children with pervasive developmental disorders: A multi-site feasibility trial. *Behavioral Interventions*, 22(4), 179–199. <https://doi.org/10.1002/bin.236>
- Sanders, M. R., Markie-Dadds, C., Tully, L. A., & Bor, W. (2000). The triple P-positive parenting program: A comparison of enhanced, standard, and self-directed behavioral family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology*, 68(4), 624–640. <https://doi.org/10.1037/0022-006X.68.4.624>
- Sharp, W. G., Berry, R. C., McCracken, C., Nuhu, N. N., Marvel, E., Saulnier, C. A., Klin, A., Jones, W., & Jaquess, D. L. (2013). Feeding problems and nutrient intake in children with autism spectrum disorders: A meta-analysis and comprehensive review of the literature. *Journal of Autism and Developmental Disorders*, 43(9), 2159–2173. <https://doi.org/10.1007/s10803-013-1771-5>
- Silverman, A. H. (2010). Interdisciplinary care for feeding problems in children. *Nutrition in Clinical Practice: Official Publication of the American Society for Parenteral and Enteral Nutrition*, 25(2), 160–165. <https://doi.org/10.1177/0884533610361609>
- St. John, B. M., & Ausderau, K. K. (2024). Changes in caregiver outcomes after participation in the engaged eaters program: A caregiver-mediated feeding intervention for autistic children and their families. *American Journal of Occupational Therapy*, 78(3), 7803205040. <https://doi.org/10.5014/ajot.2024.050444>
- Stark, L. J., Owens-Stively, J., Spirito, A., Lewis, A., & Guevremont, D. (1990). Group behavioral treatment of retentive encopresis. *Journal of Pediatric Psychology*, 15(5), 659–671. <https://doi.org/10.1093/jpepsy/15.5.659>
- Watson, E. (2012). *Validation of a multi-nutrient food frequency questionnaire to determine nutrient intakes of New Zealand toddlers 12-24 months old University of Otago, Dunedin, New Zealand.*
- Zaidman-Zait, A., Miranda, P., Zumbo, B. D., Wellington, S., Dua, V., & Kalynchuk, K. (2010). An item response theory analysis of the Parenting Stress Index-Short Form with parents of

children with autism spectrum disorders. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 51(11), 1269–1277. <https://doi.org/10.1111/j.1469-7610.2010.02266.x>

Zlomke, K., Rossetti, K., Murphy, J., Mallicoat, K., & Swingle, H. (2020). Feeding problems and maternal anxiety in children with Autism Spectrum Disorder. *Maternal and Child Health Journal*, 24(10), 1278–1287. <https://doi.org/10.1007/s10995-020-02966-8>