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Research

Investigation of the EATS feeding assessment as an outcome measure: A case series

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Abstract

Pediatric feeding difficulties can be categorized as developmental, motor-based, sensory-based, or behavioral. Sensory-based feeding difficulties result from dysfunctional responses to mealtime stimuli. The Environment, Attitudes, Temperament, and Sensory (EATS) Feeding Assessment is a caregiver questionnaire designed to assess sensory-based feeding difficulties and factors related to feeding performance. This report outlines the fourth phase of research, determining if the EATS Feeding Assessment can be used as an outcome measure. Data were collected at baseline and at six-month follow-up following standard outpatient occupational therapy treatment for sensory-based feeding difficulties. Quantitative scores from the attitudes, temperament, and sensory sections were compared, excluding the qualitative environment section. Standard care for treatment included sensory strategies, caregiver education, environmental modification, and fine motor coordination. At follow-up, all three children demonstrated improvements in temperament and sensory scores. Two children had improvements in attitudes scores while one had no change. The EATS Feeding Assessment should now undergo further investigation as an outcome measure to ensure generalizability of these results.

INTRODUCTION

Pediatric feeding difficulties can be categorized as developmental, motor-based, sensory-based, or behavioral (LaManna & Miluk, 2023). Sensory-based feeding difficulties result from dysfunctional responses to mealtime stimuli (Koch, 2018). Sensory-based feeding difficulties may be misconstrued as picky-eating or defiant behavior (Trofholz et al., 2017). These incorrect assumptions often exacerbate an already challenging situation (Provost et al., 2010). Caregivers of these children may be tempted to provide extreme accommodations for their child or rely on harmful practices such as force-feeding (Chao & Chang, 2017). Therefore, accurate and timely evaluation and treatment are necessary for the well-being of child and family.

Children with sensory-based feeding difficulties can improve with pediatric occupational therapy treatment (Gándara-Gafo et al., 2021). Occupational therapists view meaningful activities as occupations – thus occupations start at birth.) Previously, pediatric occupational therapists were tasked with identifying and assessing feeding difficulties; however, no formal assessment tools existed. Therapists had to rely on their clinical judgement and experience while piecing together other unrelated eating assessments to evaluate and treat these children (Carsone & Smith, 2024a). The Environment, Attitudes, Temperament, and Sensory (EATS) Feeding Assessment was developed to address this need (Carsone & Smith, 2024a).

The EATS Feeding Assessment consists of open-ended, qualitative questions that describe the child's feeding environments. Attitudes of the caregiver are assessed on a Likert-scale to gauge the caregiver's awareness, understanding, and stress regarding their child's feeding difficulty. Temperament of the child provides a picture of the child's long-term, consistent behaviors and responses to feeding. Temperament focuses on the frequency of more problematic behaviors (e.g., crying and screaming) that need to be holistically considered. The sensory section provides paired questions differentiating seeking and avoiding behaviors. For attitudes, temperament, and sensory a higher score correlates to greater difficulty whereas a lower score correlates to less/no difficulty (Carsone & Smith, 2024a; Carsone & Smith, 2024b).

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Since its creation, the EATS Feeding Assessment has undergone validity and reliability testing. The first phase established content validity from an expert panel. The second phase determined whether the EATS questions were understandable, answerable, and appropriate for all ages via a survey of caregivers of children who were not having feeding problems, but developing typically (Carsone & Smith, 2024a). The third phase investigated the discriminant validity of the EATS Feeding Assessment, demonstrating the ability of the assessment to differentiate those with and without feeding difficulties (Carsone & Smith, 2024b). The present study provides findings from the fourth phase of research for the EATS Feeding Assessment, investigating the assessment's ability to detect change over time as an outcome measure. The research aimed to answer the question, "Do EATS Feeding Assessment scores detect change over time?"

MATERIALS AND METHODS

The study received Institutional Review Board (IRB) approval from Gannon University's IRB GUIRB-2023-11-7190. A retrospective case series was utilized to answer the research question.

Three outpatient pediatric therapists who were previously trained on the EATS Feeding Assessment utilized the form with their sensory-based feeding clients. The EATS Feeding assessment survey sought responses for the ATS (Attitudes, Temperament, Sensory) sections of the EATS, as those questions are quantitative with numerical scores. The environment section was omitted, as those questions are qualitative. Changes in scores from baseline to six months were calculated. For attitudes, temperament, and sensory sections, a higher score equates to higher dysfunction. Scoring for sensory-based feeding difficulties was based on normative data up to 2 standard deviations from the mean (Carsone & Smith, 2024b). Therefore, ranges on the EATS are defined as "with sensory-based feeding difficulty" ("with difficulty") or "without sensory-based feeding difficulty" ("without difficulty").

Inclusion criteria included caregivers of children aged 24 months to 10 years 11 months with feeding concerns, and received standard therapy services. Cases were excluded if they did not have baseline or six-month follow-up data, or did not receive standard therapy.

Standard occupational therapy feeding treatment consisted of a variety of therapeutic procedures including sensory techniques (e.g., modulation, remediation, and adaptation), self-care training, caregiver education, environmental modification, therapeutic exercises, and therapeutic activities. Standard occupational therapy feeding sessions were in person, consistently 30 minutes in length, and provided one on one by an occupational therapist or occupational therapy assistant. Each occupational therapy session took place in an outpatient setting. Typical treatment sessions started with physically engaging sensory-based activities to ensure the child was regulated then progressed to sensory-based play with foods with the therapist modeling as needed. The sessions usually ended with caregiver education for carryover activities.

Each therapist and assistant who delivered the interventions had additional sensory-based feeding training through informal and formal mentorship by the one researcher (B.C.). The providers thoroughly documented each session via electronic medical records on Raintree with formal reassessments occurring every 6 months.

RESULTS

Three therapists used the assessment 21 times over the course of one year. However, only 8 EATS Feeding Assessments were submitted to the researchers at baseline and follow-up. After reviewing the chart, only 3 children had received standard occupational therapy feeding treatment. Case one was a 4-year-old male who received only standard occupational therapy feeding treatment. Case two was a 9-year-old female who received only standard occupational therapy feeding treatment. Case three was a 9-year-old male who received both standard occupational therapy feeding and speech therapy treatments.

Case one attended 17 occupational therapy sessions and did not receive any other services. Case two attended 17 occupational therapy sessions and did not receive any other services. Case three attended 4 occupational therapy sessions and 32 speech therapy sessions for an unrelated speech delay. Scores for the three children can be seen in Table 1 below.

Table 1. EATS feeding assessment scores

Case Number	Baseline Scores	Follow-up Scores
1	Caregiver Attitudes: 9 Temperament: 11 Sensory: 23	Caregiver Attitudes: 4 Temperament: 6 Sensory: 15
2	Caregiver Attitudes: 12 Temperament: 14 Sensory: 34	Caregiver Attitudes: 9 Temperament: 5 Sensory: 12
3	Caregiver Attitudes: 13 Temperament: 16 Sensory: 27	Caregiver Attitudes: 13 Temperament: 13 Sensory: 19

Note. For attitudes, temperament, and sensory sections, a higher score equates to higher dysfunction whereas a lower score equates to less dysfunction.

Regarding caregiver attitudes, two subjects had improvements while one did not have a change in score. For case one, the baseline score was within the "feeding difficulty" range while the follow-up had improved to the "without difficulty" range. Case two noted improvement; however, the follow-up score remained within the "with difficulty" range.

Regarding temperament, all three subjects had improvements. All three baseline scores were within the "with difficulty" range. For case one and two, follow-up scores fell within the therapist discretion range, which is typically labelled as "without difficulty," while the third remained in the "with difficulty" range.

Regarding sensory scores, all three subjects had improvements. All three baseline scores were within the "with difficulty" range. For case one and three, follow-up scores fell within the therapist discretion range, which is typically labelled as "without difficulty," while the second case subject remained in the "with difficulty" range.

DISCUSSION

In summary, all three children demonstrated improvements in temperament and sensory scores. Two children had

improvements in caregiver attitudes scores while one had no change. Some scores improved so much that the children went from "with difficulty" ranges to without difficulty. Specifically, case one improved to "without difficulty" for all three sections. Case two transitioned from "with difficulty" to "without difficulty" for temperament while their improvements in caregiver attitudes and sensory but remained in the "with difficulty" range. Case three had improvements in temperament ("with difficulty") and sensory ("without difficulty") while their caregiver attitudes score remained the same.

These findings were encouraging, illustrating that not only could the EATS detect change over time, but that children could improve substantially with six months of occupational therapy feeding treatment. The first and second cases demonstrated greater improvements and had higher rates of attendance than the third case; however, all noted some form of improvement from baseline to follow-up.

Regarding future care, case one would be ready for discharge. Case two would be appropriate for continued feeding intervention. Case three would no longer need intervention for sensory-based feeding difficulties but would benefit from continued occupational therapy to address the child's temperament and caregiver's attitudes scores.

Overall, therapists may use the EATS Feeding Assessment as an outcomes measure. Improvements in scores should be anticipated by the six-month follow-up. The EATS Feeding Assessment should now undergo further investigation as an outcome measure to ensure generalizability of these results.

KNOWLEDGE TRANSLATION TAKEAWAY

The EATS Feeding Assessment may be used as an outcome measure to detect change over time. Therapists and families should expect positive changes to quantitative scores following standard occupational therapy feeding treatment.

CONCLUSION

This report outlines the fourth phase of research, determining if the EATS Feeding Assessment can be used as an outcome measure. Due to the specialized nature of feeding therapy, only three subjects met the inclusion criteria of having received only standard occupational therapy treatment. Quantitative scores from the attitudes, temperament, and sensory sections were compared, excluding the qualitative environment section. All three children demonstrated improvements in temperament and sensory scores. Two of the three children also had improvements in their attitudes scores, while one had no change. Although the fourth phase only had three cases, the results are promising that the EATS Feeding Assessment can be an outcome measure for children with sensory-based feeding difficulties. The EATS Feeding assessment may be utilized as an outcome measure until further research can be conducted to confirm or dispute the findings of this study.

AUTHOR CONTRIBUTIONS

Conceptualization, Formal analysis, Project administration, Resources – BC and BS. Data curation, Investigation, Software – BC. Methodology, Supervision, Validation – BS. Writing – Original draft and the Review & editing – Both authors.

CONFLICT OF INTEREST

The authors declare that they have no other potential conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

Nothing to disclose.

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