

# Investigation of Assessment Tools in the Area of Pediatric Feeding Evaluation: A Mixed-Methods Study

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**Importance:** The new diagnostic code for pediatric feeding disorder (PFD) in the *International Classification of Diseases, 10th edition, Clinical Modification*, requires that occupational therapists and speech-language pathologists (SLPs) use valid and reliable assessment tools that capture the complexity of PFD.

**Objective:** To determine current assessment tools that clinicians are using across the four domains of PFD: (1) medical factors, (2) nutrition factors, (3) feeding skill factors, and (4) psychosocial factors. A secondary objective was to obtain clinicians' perceptions of the assessment tools.

**Design:** A mixed-methods study using survey research and focus groups.

**Setting:** Online survey and virtual focus groups.

**Participants:** Occupational therapists and SLPs who identified as clinicians who treat PFDs.

**Results:** The survey revealed that 65% of the clinicians ( $N = 445$ ) used a nonstandardized assessment tool across the four domains of PFD. The focus groups ( $n = 26$ ) revealed four resulting themes that expanded the survey results: (1) no one assessment tool works, (2) clinicians rely on self-created assessments, (3) it takes a team and collaboration, and (4) there are many issues with the current assessment of PFD.

**Conclusions and Relevance:** This study reveals the need for clinicians working with children with PFD to use feeding assessment tools with sound psychometric properties. The requirement for occupational therapists and SLPs to evaluate and treat dysphagia and disorders of feeding indicates the need to provide entry-level education on reliable and valid assessment tools that thoroughly evaluate all the domains of PFD.

**What This Article Adds:** This article highlights current assessment tools used by occupational therapists and SLPs treating PFD and the need for more standardized procedures and tools to evaluate children across the four domains of PFD.

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Pediatric feeding disorder (PFD) affects an estimated 25% to 45% of typically developing children (Silverman et al., 2020), 42% of children who were born premature (Pados et al., 2021), and up to 89% of children with developmental disabilities (Benjasuwan-*tep et al.*, 2013). PFD is also becoming more prevalent, with an estimated 1 in 23 to 1 in 37 children diagnosed younger than age 5 yr (Kovacic et al., 2021). Neurological impairments and disorders increase a child's risk of developing a PFD, and those with severe motor and cognitive delays often have greater impairment in feeding skills (Goday et al., 2019). It is estimated that 1 in 3 to 1 in 5 children with a chronic

disease also has a diagnosis of PFD (Kovacic et al., 2021). It is important to note that there are varying levels of feeding disorders, ranging from limited intake of certain types and textures to more severe disorders requiring feeding tubes and medical intervention (Didehbani et al., 2011). The severity of a child's health condition is correlated with the severity of the child's feeding difficulties (Park et al., 2019).

Using the World Health Organization's (2001) *International Classification of Functioning, Disability, and Health* framework, Goday and colleagues (2019) proposed new diagnostic criteria and defined PFD as "impaired oral intake that is not age-appropriate, and

is associated with medical, nutritional, feeding skill, and/or psychosocial dysfunction” (p. 125). The new classification of PFD, which is now a code in the *International Classification of Diseases, 10th Edition, Clinical Modification (ICD-10-CM; World Health Organization, 1999)*, includes four domains that underlie the PFD diagnosis, leading to decreased performance and participation in many aspects of mealtime occupations: (1) medical factors, (2) nutrition factors, (3) feeding skill factors, and (4) psychosocial factors (Goday et al., 2019). Disability occurs when aspects of the domains influence one another, creating decreased occupational participation resulting from person, environment, and health condition factors. According to Thoyre et al. (2018), a diagnosis of PFD is typically viewed as a product of a combination of interactions among the child, environment, and features of the task itself, making it imperative that occupational therapists and speech-language pathologists (SLPs) who work with children with PFD use assessment tools that look at all four of the domains to create a comprehensive treatment plan that focuses on the multiple complexities of mealtime occupations.

Domain 1 of PFD comprises medical factors, which include impairments in swallowing, called *dysphagia*. Dysphagia is often connected to an impaired structure or function of the gastrointestinal, cardiorespiratory, or neurological systems (Goday et al., 2019). Children referred for feeding therapy often have other medical conditions, such as constipation (76%), gastroesophageal reflux (63%), food allergies (36%), neurological conditions (23%), and pulmonary diseases (19%), that both underlie and further affect the feeding and eating process (Rivera-Nieves et al., 2019).

Domain 2 involves nutrition factors. This domain represents nutritional dysfunction indicated by malnutrition or nutrition deficiencies related to restricted dietary intake or a lack of dietary diversity (Goday et al., 2019). Many cases of PFD consist of restricted consumption of quality, quantity, and variety of food and drinks. This can result in malnutrition, overnutrition, micronutrient deficiency or toxicity, and dehydration, which affect up to 50% of children with PFD.

Domain 3 of PFD involves feeding skill factors. Oral-sensory and oral-motor function impairments can cause limited intake and intolerance of both solid and liquid textures that are considered age appropriate (Goday et al., 2019). Moreover, difficulties in oral-motor functioning may affect lip closure and seal, bolus control and manipulation, and mastication and swallowing. Included in this domain are not only the ability to handle food and liquid in the mouth in preparation to swallow but also the ability to eat age-appropriate foods and textures within an appropriate time frame.

The final and fourth domain included in Goday and colleagues’ (2019) classification of PFD comprises psychosocial factors. Psychosocial factors can have a compounding effect on feeding dysfunction and

include aspects of the child, caregiver, and environment. This inclusion of context, environment, and family closely aligns with the American Occupational Therapy Association’s (AOTA’s) *Occupational Therapy Practice Framework* (4th ed.; AOTA, 2020).

Problem feeding behaviors secondary to these factors are among the most common concerns expressed by caregivers. Other factors that contribute to psychosocial aspects of PFD are developmental issues, mental and behavioral health problems, social influences, and environmental features (Goday et al., 2019). Kerzner et al. (2015) emphasized how mealtime structure provided by caregivers can play a significant role in the child’s feeding process and noted that anxious parents sometimes adopt inappropriate feeding practices.

## Assessment of Pediatric Feeding Disorder

A current barrier to the diagnosis and treatment of the new PFD diagnosis is the lack of a standardized approach toward feeding evaluations conducted by clinicians (Goday et al., 2019). In a systematic review, Pichardo et al. (2020) found a general absence of clear technological descriptions and procedures to address PFD. They emphasized the need for clear language and definitions to increase the validity of feeding assessments and to ensure that all domains of PFD have been taken into consideration. This is further complicated by the extensive use of nonstandardized assessments and clinical observation data on the part of clinicians working with children with PFD (Barton et al., 2018). The validity and reliability of an assessment tool should be key considerations in the selection of an appropriate assessment tool because this ensures the accurate assessment of the intended PFD domain, or the aspect that is affecting PFD, and that other providers and families are receiving the most accurate evaluation results (Speyer et al., 2018).

Before the accepted definition of PFD by Goday and colleagues in 2019, Heckathorn et al. (2016) conducted a systematic review of 30 noninstrumental swallowing and feeding assessments in used in pediatrics. They organized the assessments into six domains: (1) oral-motor skills, (2) behaviors, (3) environmental factors, (4) feeding and swallowing skills, (5) sensory aspects of swallowing and feeding, and (6) quality of life. The researchers found that most assessments touched about two domains, but not one of the 30 assessments covered all six domains to thoroughly assess a child’s swallowing and feeding concerns. They also noted that the lack of validity and reliability evaluations for the assessments in use is problematic and recommended that clinicians use the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) developed by Mokkink and colleagues (2010) to examine the psychometric properties of the assessment they use.

Speyer et al. (2018) conducted a systematic review using the COSMIN, as Heckathorn and colleagues (2016) suggested, for pediatric feeding and swallowing assessments. They found that 8 out of 22 assessments they reviewed contained researched psychometric properties that could be reviewed using the COSMIN, and, of those, all had missing or incomplete data. The most concerning finding was the absence of content validity for most of the assessments. The authors noted that the Dysphagia Disorder Survey (DDS; Sheppard et al., 2014) was the most robust assessment based on the data provided from their study (Speyer et al., 2018). They further argued that, to ensure quality results, assessments with strong ratings for all psychometric properties should be prioritized over assessments with little psychometric data.

Oral–motor skill assessment tools have also been investigated. Barton and colleagues (2018) conducted a systematic review of oral–motor feeding assessments and found only nine with published psychometric properties for both reliability and validity for children ages 6 mo to 18 yr. Both the modified Functional Feeding Assessment (FFAm; Gisel, 1994) and the Oral Motor Assessment Scale (OMAS; de Oliveira Lira Ortega et al., 2009) were found to have very good interrater reliability and adequate validity. The Schedule for Oral Motor Assessment (SOMA; Skuse et al., 1995) was found to have very good intrarater reliability and adequate predictive validity. The authors concluded that clinicians, when choosing appropriate tools for their evaluations, need to consider the inadequate amount of psychometric evidence of the assessment tools they reviewed.

There are also several parent-report pediatric feeding assessment tools with published psychometric properties since Speyer et al.'s (2018) and Barton et al.'s (2018) systematic reviews. The Child and Oral Motor Proficiency Scale (ChOMPS; Sanchez & Morgan, 2018) has evidence of content validity (Pados et al., 2019). The Pediatric Eating Assessment Tool (PediEAT; Thoyre et al., 2018) and the Feeding Impact Scales (Estrem et al., 2022) are both parent-report assessment tools with published psychometric properties for reliability and validity that were found to be acceptable.

The Parenting Stress Index (PSI) is a parent-report questionnaire that has been used in the treatment of feeding difficulties to address psychosocial concerns, although the assessment is not specific to feeding, and the validity and reliability studies were not conducted with parents of a child with a PFD (Lee et al., 2016). Similarly, the Family Management Measure of Feeding (FaMM Feed) does not yet have published psychometric properties, unlike the original Family Management Measure (Knafl et al., 2011). The Behavioral Pediatrics Feeding Assessment Scale (BPFAS; Allen et al., 2015) is another parent-report assessment tool used to address the psychosocial dysfunction that commonly occurs with children diagnosed with PFD (Crist & Napier-Phillips, 2001). The BPFAS is a valid and

reliable tool that has also been found adequate for use with autistic children (Allen et al., 2015).

Since 2005, the prevalence of PFD has continued to rise, and it is now more common than autism spectrum disorder (Kovacic et al., 2021). This rise in prevalence can be attributed to not only an increased awareness of PFD but also the increase in premature births, children with complex chronic conditions, the decrease of gastrostomy tube placements, and diagnoses of malnutrition (Kovacic et al., 2021). The unified definition of PFD provided by Goday and colleagues (2019) exposed the need to closely examine the assessment tools currently being used by clinicians working with children with PFD. The literature contains information on a wide variety of pediatric feeding assessments that are used, despite the limited evidence for the psychometric properties of some of them. The purpose of this study was to address, using a mixed-methods design, the following three research questions: (1) What are occupational therapists and SLPs using for assessment tools in practice, (2) to what extent do current assessments used by occupational therapists and SLPs address the four domains of PFD, and (3) what are clinicians' perceptions of current assessment tools used to evaluate PFD?

## Method

### Design

This study had a mixed-methods research design and included both a survey and focus groups. Institutional review board approval was obtained through Paula A. Rabaey's and Kate Barlow's institutions (Protocol No. 20203-1). A sequential explanatory strategy was used in which the collection and analysis of quantitative data were followed by the collection and analysis of qualitative data (Terrell, 2011). The data were collected in two phases, with the specific intent of having the qualitative data help explain and explore results revealed by the quantitative data (Terrell, 2011). This mixed-methods approach allowed us to follow up, in the focus groups, results (both expected and unexpected) from the survey. Mixing of the data let us integrate data, allow for expansion on survey questions that had a single answer, and gather more details about why participants selected certain feeding assessments and how those assessments addressed the four domains of PFD.

### Participants

#### Survey Participants

Survey participants included 263 occupational therapists and 182 SLPs practicing in a variety of pediatric settings across the United States ( $n = 372$ ) and outside of the United States ( $n = 52$ ) and worked with children between the ages of 6 mo through 10 yr. Of the 263 occupational therapist respondents, 29% had a bachelor's degree, 60% had a master's degree, and 11% had a doctoral degree. Across SLP practitioners, 6% had a bachelor's degree, 91% had a master's degree, and 2% had a doctoral degree. Survey participants had a mean of 13.5 yr of practice (range = 2–60 yr).

## Focus Group Participants

At the end of the survey, participants were asked if they would like to take part in a focus group to further discuss assessment tools used to evaluate the four domains of PFD and their perceptions of the efficacy and accuracy of the assessment tools in evaluation and intervention planning with children with feeding disorders. Four focus groups were conducted in June 2020 with a total of 26 participants ( $n = 9$  occupational therapists and 17 SLPs). Each focus group had between 6 and 8 participants, with a mix of both occupational therapists and SLPs. Participants worked across a variety of pediatric settings and had between 1.5 and 60 yr of clinical experience ( $M = 16$  yr).

## Instruments

### Participant Survey

The participant survey was created by Rabaey and Barlow using Microsoft Forms. It included 20 items comprising two sections related to the participant's area of practice and experience in feeding therapy and their choice of assessment tools that coincide with each of the four domains of PFD (see the Supplemental Appendix, available online with this article at <https://research.aota.org/ajot>). *Assessment tool* was defined as "any tool used to gather information in the initial evaluation of the child" (AOTA, 2020). Survey participants were given choices of feeding and eating assessment tools that have been cited in the literature within each domain with the opportunity to write down additional tools they use (they could check all that applied). There were five background items that inquired about demographic characteristics, including therapy discipline (occupational therapy or SLP), state and setting of practice area, education level, and years of experience. The remaining items were organized according to each of the four PFD domains and asked respondents which assessment tools they used, how satisfied they were with the information gained from each tool (rated on a 5-point Likert scale), and the percentage of children who had feeding difficulties within that PFD domain.

## Procedure

### Participant Survey

Recruitment of occupational therapy and SLP clinicians for the survey occurred through Facebook, LinkedIn, AOTA listservs, and American Speech-Language-Hearing Association email blasts, as well as email advertisements through feeding clinics located in various regions of the United States. The survey was available from May 1 to June 30, 2020.

### Focus Groups

The focus groups were conducted to explore, clarify, and expand findings from the participant survey regarding use of feeding assessment tools, clinical reasoning process in choosing the assessment tools, and the perceived effectiveness of current tools in the

evaluation of children with PFD. Questions were categorized by each of the four PFD domains and asked participants to speak to the assessment tools used in each domain and why they chose those specific tools. Both Rabaey and Barlow conducted the focus groups, along with an occupational therapy student graduate research assistant. The focus groups were structured, and a script was followed by both researchers to ensure uniformity of the focus group process. All focus groups were conducted virtually through Zoom, were videotaped, and were approximately 60 min in length.

### Data Analysis

Analysis of the survey and the focus group data were first conducted independently. Descriptive statistics were used to analyze items from the survey sections. Focus group data were transcribed and analyzed using a sequential approach and constant-comparative analytic framework to identify key concepts and themes from the participants' responses (Krueger & Casey, 2009). Using a constant-comparative framework approach allows one to identify patterns in the data and discover relationships between concepts identified by the participants (Krueger & Casey, 2009). We used this approach to compare responses to the PFD domain questions across the four focus groups to identify similarities and differences. Transcripts were independently coded by Rabaey and an occupational therapy graduate research assistant and then condensed into categories. Overall themes were identified on the basis of the key factors and core ideas that participants conveyed about the feeding assessment tools and their effectiveness in gathering information. Rigor and trustworthiness were enhanced through triangulation of multiple data sets, external review by Barlow, and member checks of the final themes on the basis of the 18 participants (Creswell & Plano Clark, 2011).

## Results

### Quantitative

Survey results indicated that both occupational therapy and SLP participants were serving children who had a feeding difficulty in one or more of the PFD domains across a variety of settings, from early intervention to inpatient hospital (Table 1). Within each of the four PFD domains, both occupational therapists and SLPs reported a variety of assessment tools used to gain

**Table 1. Children With Feeding Difficulties by PFD Domain (Therapist Report)**

PFD Domain	Total Survey Responses	%, $M$ ( $SD$ )
1	439	29.14 (28.45)
2	438	31.99 (26.69)
3	440	54.00 (29.16)
4	435	40.24 (31.36)

*Note.* PFD = pediatric feeding disorder.



information. Caregiver interviews, clinical observations, and nonstandardized checklists were the most commonly used tools across all four domains. In addition, within Domain 1 (medical), participants also reported using a videofluoroscopic swallow study ( $n = 152$ ), the Beckman Oral Motor Protocol (<https://www.beckmanoralmotor.com>;  $n = 82$ ), the PediEAT ( $n = 46$ ), and the DDS ( $n = 5$ ). In Domain 2 (nutrition), participants reported using a caregiver food diary ( $n = 268$ ), the PediEAT ( $n = 40$ ), and the Feeding Impact Scales ( $n = 15$ ). In Domain 3 (feeding skills), participants reported using a videofluoroscopic swallow study ( $n = 99$ ), the Beckman Oral Motor Protocol ( $n = 87$ ), the ChOMPS ( $n = 40$ ), the OMAS ( $n = 27$ ), the FFAM ( $n = 11$ ), and the SOMA ( $n = 5$ ). In

Domain 4 (psychosocial), participants reported using a video analysis of the caregiver and child during mealtime ( $n = 127$ ), the PSI ( $n = 29$ ), the BPFAS ( $n = 23$ ), the Feeding Impact Scales ( $n = 19$ ), and the FaMM Feed ( $n = 13$ ). Differences between occupational therapist and SLP responses are highlighted in Table 2.

Of the four PFD domains, participants reported assessing components of Domain 3 most frequently, which includes oral-sensory and oral-motor functioning and pharyngeal motor functioning. Across the four domains, the parent/caregiver interview was the most used tool for gathering information, with a range of 88.2% (Domain 2) to 97.8% (Domain 3). This was followed by medical record review and observation of

**Table 2. Assessment Tools Used Most Often, by PFD Domain (Occupational Therapy and Speech Therapy)**

PFD Domain and Assessment Tools	Total OTs, $n$ (%)	Total SLPs, $n$ (%)
<b>Domain 1</b>		
Caregiver interview	238 (90.5)	173 (95.1)
Observation of feeding and swallowing	233 (88.6)	171 (94.0)
Nonstandardized data-collecting template	151 (57.4)	111 (61.0)
Beckman Oral Motor Protocol	53 (20.2)	29 (15.9)
Videofluoroscopic Swallow Study	63 (24.0)	87 (47.8)
Referral to other medical professional	131 (49.8)	99 (54.4)
<b>Domain 2</b>		
Caregiver interview	252 (95.8)	163 (89.6)
Medical record review	214 (81.4)	156 (85.7)
Nonstandardized data-collecting template	141 (53.6)	101 (55.5)
Observation of feeding and swallowing	196 (74.5)	152 (83.5)
Caregiver report food diary	148 (56.3)	117 (64.3)
Referral to other medical professional	123 (46.8)	108 (59.3)
<b>Domain 3</b>		
Caregiver interview	252 (95.8)	178 (97.8)
Medical record review	213 (81.0)	158 (86.8)
Observation of feeding and swallowing	251 (95.4)	178 (97.8)
Nonstandardized data-collecting template	171 (65.0)	123 (67.6)
Beckman Oral Motor Protocol	58 (22.1)	29 (15.9)
Videofluoroscopic Swallow Study	33 (12.5)	63 (34.6)
Referral to other medical professional	69 (26.2)	80 (44)
Other	50 (19.0)	21 (11.5)
<b>Domain 4</b>		
Caregiver interview	249 (94.7)	169 (92.9)
Medical record review	195 (74.1)	145 (79.7)
Observation of mealtime with child and caregiver	238 (90.5)	168 (92.3)
Nonstandardized data-collecting template	173 (65.8)	118 (64.8)
Video analysis of mealtime with child and parent	68 (25.9)	118 (64.8)
Referral to other medical professional	54 (20.5)	82 (45.1)

*Note.* Assessment tools that were reportedly used by over 20% of respondents were included. Other assessments were reported by 0.4% to 10% of clinicians. OT = occupational therapist; PFD = pediatric feeding disorder; SLP = speech-language pathologist.

feeding and swallowing skills (see Table 2). When asked how satisfied they were with the assessment tools they used (rated on a 5-point Likert scale), the percentage range of “agree” for each domain was 50.5% (Domain 4 [psychosocial factors]) to 64.3% (Domain 3).

## Qualitative

Four themes emerged from the focus group data: (1) no one assessment tool works, (2) clinicians rely on self-created assessments, (3) it takes a team and collaboration, and (4) there are many problems and issues.

### *Theme 1: No One Assessment Tool Works*

This was an overriding theme throughout all four domains of PFD. Participants indicated that they used many different assessment tools to gather initial information during a feeding evaluation and stated that tool selection depended on the emphasis of the domain, age of the child, and the setting in which they were working. They reported using tools that assessed motor skills, swallow ability, oral–motor function, and diet (types and textures of food eaten) the most, which fall within PFD Domains 2 and 3: “I have a series of questionnaires about the family, mealtimes, the medical history, the whole gamut that goes out to everybody who’s coming in.” There was also a wide variation in what participants thought should be used and what types of things were most important to assess; this often varied by the participant’s years of experience. Insurance and documentation requirements were considered in assessment tool selection, along with the fact that there are not many standardized assessments for feeding and eating to choose from: “I have a template that we will use with questions on it, and a lot of it’s reflected honestly, in our documentation.” All therapists used more than one assessment tool across all domains but still stated that “things got missed.”

### *Theme 2: Clinicians Rely on Self-Created Assessments*

This theme was repeated multiple times across all four focus groups and was similar to the survey results. Participants assessed certain domains of PFD on the basis of their level of experience and knowledge of assessments in that domain. Participants often stated they did not have any one tool that they used but rather that what they assessed was “in their heads.” Most of the self-created tools were nonstandardized and observation based:

From my experience both in working with a lot of kids with neuromotor problems and also sensory-based problems and also the kind of environment I work with, I don’t use any standardized test. Like the rest of you, I’ve made up my own and I like it a lot.

Although there were similarities regarding assessment, these often differed by years of experience,

discipline, and level of knowledge in a particular area. For example, all participants reported assessing oral–motor skill function, but the skills that were looked at varied greatly. Some participants reported looking closely at tongue, cheek, and lip movements, whereas others focused heavily on chewing abilities and textures of food the child could handle: “I’ve taken all kinds of pieces from this and pieces from that.” More experienced participants reported writing down what they assessed for students and new therapists. These self-created assessments did not always cover all four domains of PFD.

### *Theme 3: It Takes a Team and Collaboration*

All participants across the four focus groups talked about collaborating, or needing to collaborate, with other professions. This was not something that was specifically asked on the survey, but it came out strongly in the focus groups within each PFD domain discussion. This was particularly evident in Domains 1, 2, and 4: “I team with [psychologists], or whoever their social–emotional provider is, to address some of the core psych concerns, and issues, especially related to trauma.” Their collaborators varied by setting and resource availability (e.g., hospital-based participants had quick access to all specialists, whereas early intervention therapists had to make referrals and rely on parental follow-through). Common collaborators were dietitians/nutritionists, gastroenterologists, and psychologists, as participants acknowledged that many things in the medical and nutrition domains were out of their scope of practice or expertise level: “So I don’t try and be a dietitian, and in fact, I was mentoring someone earlier today and the biggest factor was needing a dietitian, so she’s working on finding someone.” Participants expressed the need for role delineation and noted discrepancies in collaboration that varied by state and rural versus urban regions.

### *Theme 4: There Are Many Problems and Issues*

This was a very prominent theme across all focus groups. Participants readily identified problems with current feeding, eating, and swallowing assessment tools. Some tools are very content and context specific (meaning they assess only one thing, e.g., sensory issues or oral–motor structures) and represent only one piece of a much larger puzzle:

These silly checklists, I am biased, I admit it. . . . First of all, often it’s very hard to know what they mean. The questions can be interpreted in many different ways. Absolutely, I don’t think any of them really get to the heart of things, which is the family.

In some settings, the need for qualifying criteria (either for early intervention or insurance purposes) only hints at a much larger feeding issue that may gradually be uncovered later. Many participants spoke of insurance difficulties and the need to report some sort of assessment with “standardized” numbers: “We do it

for the insurance companies, we do it for whomever, but we don't do it for the parents, we don't do it for the collaborative teams we're working with." There was also a need to adapt many of the tools to the child's age and diagnosis, as well as the setting where the therapist practiced: "One of the things that these tests do not do that we have that I would love to see, is more defining of how you test it [the skills]." This led to participants using "bits and pieces" from multiple assessment tools, which was reflected in the surveys, as therapists could check all assessments that applied within a PFD domain.

## Discussion

In this mixed-methods study, we sought to explore the current assessments being used by clinicians working with children with feeding difficulties and examined their fit with the new PFD diagnosis that provides a more comprehensive framework and common terminology of feeding disorders for health care professionals. In addition, we explored perceptions of the efficacy of and fit with the four PFD domains because clinical reasoning is an important component of the evaluation process with children with PFD. As noted, PFD is a complex diagnosis that requires more than one assessment tool to complete a comprehensive therapy evaluation. Consistent with the previous literature, participants in this study acknowledged the need to use multiple assessment tools ensure their evaluation and subsequent treatment plan covered more than one domain of PFD (Rivera-Nieves et al., 2019; Thoyre et al., 2018).

Both the survey and focus group results revealed a high percentage of assessment tools that were nonstandardized or "made up" being used by current clinicians, with caregiver interviews and medical record reviews used the most by study participants across all four domains of PFD. Participants also described their made-up assessments as comprising components from multiple assessments. Often, the participants with more years of experience reported having the assessment "in their heads." Domain 3 was assessed the most by both occupational therapists and SLPs, but it also had the widest variability in assessment methods and tools used by the therapist or in the practice setting. These findings correlated with those of Barton et al. (2018), who reported the extensive use of nonstandardized oral-motor assessments and clinical observations with varying levels of psychometric data available.

Assessment tools reported in the literature as having published psychometric properties were being used the least by participants, according to the study results. The SOMA was used by only 4 survey participants, and the ChOMPS was reportedly used by only 40. This finding is concerning, because feeding skills (both oral-sensory and oral-motor), Domain 3, is a main contributing factor to PFD, given that they often directly influence the other three domains (Goday et al., 2019). In particular, using observational measures of oral skill that are just "in therapists' heads" and do not

have standardized recording measures or scoring criteria can jeopardize the evaluation findings and third-party payment coverage. Barton and colleagues (2018) acknowledged that there is a range of "clinically pertinent tools" available that assess oral-motor skill in children, but they added that some required advanced training or certification and emphasized that the psychometric properties of most of the tools had limited evidence and should be used and interpreted with caution. These barriers were noted by the participants in the focus group discussions and given as a reason why they often made up their own tool.

It is interesting that occupational therapists and SLPs reported using similar assessment tools across the four domains of PFD, with the exception of videofluoroscopic swallow studies. This finding is not surprising, given the fact that this is part of SLP entry-level professional training. For occupational therapy professionals, instrumental evaluation, including videofluoroscopy, is an advanced-level occupational therapy practice skill (AOTA, 2017). It is important to note that participants in both professions reported low use of feeding assessment tools named in the literature as having clinical or psychometric properties. These tools included the BPFAS, ChOMPS, DDS, FFAM, Feeding Impact Scales, OMAS, PediEAT, and SOMA. These assessments were all included in the study survey and had a reported use by participants in both disciplines of less than 22% across any of the four domains. These assessments were rarely or never mentioned across the focus group discussions.

One important finding in this study was the therapist's identification of the need to collaborate when working with children with PFD and their families. Although this was not made apparent by the survey results, qualitative data from the participant focus groups consistently indicated that working with an interdisciplinary team was the best treatment approach to PFD and the complexities it presents. One participant stated, "At our outpatient clinic, we typically do team feeding [evaluations]." Another emphasized that they always collaborate with other professionals in other fields, such as psychology and social work. This confirmed Goday and colleagues' (2019) conclusion that children with PFD need an initial evaluation that includes all four domains and requires a team approach to ensure optimal care and management. The team approach to pediatric feeding problems has also been previously documented and emphasized in the literature (Arvedson, 2008; McComish et al., 2016). Although a major problem still exists in accessing other team members (in particular in rural areas), such as dietitians, psychologists, and specialty physicians, a broader awareness of PFD could promote more consistent assessment and collaboration across health professionals.

The use of a mixed-methods design allowed for findings to emerge from the qualitative data that were

not evident in the survey data. Focus group participants emphasized the lack of available assessment tools that addressed the many complicated components of PFD, an important finding that did not emerge from the survey data alone. Although participant satisfaction with assessment tools in each domain on the survey ranged between 50% and 65%, participants in the focus groups consistently indicated the need to use components of various assessment tools together to gather all the necessary information on the child's feeding difficulty, and they acknowledged that feeding skill observations, in particular, had no standardization and were heavily reliant on the therapist's years of experience. This is not unlike Heckathorn et al.'s (2016) findings that most of the feeding assessments used in pediatric practice addressed only two of six domains into which their systematic review categorized the assessments. The number of assessments with researched psychometric properties and adequate reliability and validity was even lower (Heckathorn et al., 2016). These results support previous research findings that a lack of common approaches and terminology related to PFD presents significant challenges to effectively treating the individual child within the family unit and their contextual environment (Pichardo et al., 2020).

The need for a standardized framework for assessing children with PFD is crucial because not only is participation in mealtime an important occupation in the first years of life, but also feeding and eating across the lifespan is a major part of occupational therapy's scope of practice (AOTA, 2017). Clinicians need to understand the four domains of PFD and have a repertoire of clinically and psychometrically sound assessment tools to ensure the best possible care for children with PFD and their families. Domain 3 is of particular importance because it is the most common domain assessed by occupational therapists and SLPs. Development of more standardized observational feeding skill assessment tools could increase coverage of occupational therapy services by third-party payers and may lead to more comprehensive treatment planning for children with PFD and their families. With the 2018 accreditation standard for entry-level occupational therapists to be able to evaluate and treat dysphagia and disorders of feeding, occupational therapists need to be able to evaluate and treat PFD with reliable and valid assessment tools that lead to effective treatment plans for children and their families. According to AOTA (2017), entry-level and advanced-level occupational therapists are in a position to help further the development of assessment and intervention protocols involved for those with feeding concerns; this also applies to advanced-level SLPs working with children with PFD.

### Limitations and Future Research

Although the results of this mixed-methods study are strengthened by the combination of quantitative and


qualitative inquiry, limitations exist in the use of a self-created survey tool that used a Likert scale. Although we sought to include a wide variety of feeding assessment tools from both the literature and practice, this list was not exhaustive, and clinicians who checked the "other" box did not always list what tool or tools they used. Participants could also check multiple assessment tool boxes under each domain, which does not indicate which one they use the most. Using the results of this pilot study, we intend to further explore comprehensive assessment components that would be crucial to include in a standardized tool for clinicians when assessing children with PFD. This will require continued partnership with Feeding Matters<sup>®</sup> and other occupational therapy and SLP clinicians around the country. Development of a more diverse team of researchers will also be necessary to conceptualize next steps.

### Implications for Occupational Therapy Practice

The results of this study have the following implications for occupational therapy practice:

- The adoption of the new PFD diagnosis and ICD-10-CM code supports the development of an evidence-based framework for clinical assessment of children with PFD across all four domains.
- Occupational therapists need continuing education to thoroughly understand the four domains of PFD and to use psychometrically sound feeding assessment tools.
- Children with PFD are best served through a collaborative and interprofessional team model that includes occupational therapy practitioners who understand and respect roles across disciplines.

### Conclusion

This study acknowledges the urgent need to adopt Goday et al.'s (2019) definition and framework of PFD to allow for a comprehensive and uniform approach to its identification, evaluation, and treatment; evidence-based research; and advocacy efforts across health care professionals. Our findings not only warrant the use of assessment tools with adequate psychometric properties but also highlight the need for creation of a standardized feeding assessment with sound psychometric properties that addresses more than one domain of PFD. Increasing insurance requirements and the need for qualifying criteria adds to the urgent need to provide a standardized framework for the assessment of PFD. 

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