

ORIGINAL ARTICLE

Nutrition

Development and validation of the new French ORALQUEST scale for evaluating feeding difficulties in young children

Béatrice Thouvenin¹ | Redha Ould-Ammar² | Lisa Ouss³ | Pascale Gavelle⁴ |
Giulia Disnan⁵ | Aurélie Royer^{1,6} | Nancy Vegas^{1,6,7} |
Catherine du Frayseix¹ | Pauline Adnot^{1,6} | Valeria Barbieri¹ |
Christine Hassler⁸ | Caroline Elie^{2,9} | Caroline Barry⁸ | Véronique Abadie^{1,6,7,8} 

Abstract

Objective: Feeding difficulties are common in children with and without somatic conditions. Our objective was to develop a parent-report questionnaire (ORALQUEST) designed to be administered by a professional and to assess feeding difficulties in children aged 9 months to 6 years.

Methods: The questionnaire explores four domains: eating behavior, oral skills, tactile and oral sensitivity, and family environment. A validation study was done in 338 children seen for feeding difficulties ($n = 74$) or receiving follow-up for conditions at risk for feeding difficulties ($n = 264$). We assessed the validity and reliability of the tool and we conducted a receiver operating characteristic (ROC) analysis to determine the best total-score cutoff.

Results: The final version of the ORALQUEST has 40 items and produces a total score and four sub-scores. Structural validity, internal consistency, and reliability were excellent; convergent validity was good to acceptable but was challenging to assess given the absence of similar tools for comparisons. The optimal total-score cutoff was 27. Among children seen for feeding difficulties, 85% had a total score ≥ 27 . Total scores above the cutoff were less common than expected in children with chronic conditions (esophageal atresia, 39%; autism spectrum disorder, 42%; complex congenital heart disease, 29%; Robin sequence, 31%; and cleft palate, 18%).

Conclusion: ORALQUEST for assessing feeding difficulties in young children demonstrated good psychometric properties in children with and without somatic conditions. The investigation by ORALQUEST of four domains may help to determine the best management strategy.

KEYWORDS

assessment, pediatric nutrition, psychometric qualities

¹General Paediatric Unit, Necker University Hospital, Paris, France

²Unit of Clinical Research, AP-HP, University Necker Hospital, Paris, France

³Child Psychiatry Unit, Necker University Hospital, Paris, France

⁴Maxillo Facial Surgery Unit, Necker University Hospital, Paris, France

⁵Paediatric Surgery, Necker University Hospital, Paris, France

⁶Reference Centre for Rare Disease «Robin Sequence and Sucking and Swallowing Congenital Disorders», Necker University Hospital, Paris, France

⁷Paris Cité University, Paris, France

⁸CESP Centre of Epidemiology and Population Health, INSERM, Villejuif, France

⁹Université Paris Cité, Inserm, Pharmacologie et Évaluations Des Thérapeutiques Chez L'enfant Et La Femme Enceinte, Paris, France

Correspondence: Véronique Abadie, Service de Pédiatrie Générale, Hôpital Universitaire Necker, 149 rue de Sèvres, 75015 Paris, France. Email: veronique.abadie@aphp.fr

Funding information: Assistance Publique - Hôpitaux de Paris

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2026 The Author(s). *Journal of Pediatric Gastroenterology and Nutrition* published by Wiley Periodicals LLC on behalf of European Society for Pediatric Gastroenterology, Hepatology, and Nutrition and North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition.

1 | INTRODUCTION

Feeding difficulties are common in typically developing children and even more so in children with underlying congenital or chronic disorders.¹ Their assessment is challenging for most healthcare professionals. Since 2019, clinicians have been using the conceptual framework designed by Goday et al. to assess feeding difficulties in children. Goday et al. defined pediatric feeding disorder (PFD) as age-inappropriate oral feeding for at least 2 weeks associated with medical and/or nutritional and/or feeding-skill and/or psychosocial dysfunction.² This definition clearly differentiates PFD from anorexia nervosa and bulimia.³ Nevertheless, the spectrum of PFD remains very broad, regarding both severity and causes.^{4,5} This conceptual framework is chiefly useful for identifying the causes and consequences of the symptoms.

In parallel with this medical approach, assessment scales can be used to diagnose feeding difficulties, assess their severity and characteristics. Most of the available scales target specific age groups, specific populations (e.g., patients with autism, disabilities, or heart disease), specific symptoms (e.g., neophobia or impaired swallowing), or specific psychological factors (e.g., poor parent-child relationship or child behavioral disorders).⁶ Some are designed primarily for screening. Among them, the Montreal Children Hospital Feeding Scale (MCHFS) has several strengths: it is a simple parental questionnaire that targets the age range of interest and has been validated in French in Canada.⁷ However, it fails to assess all the psychosocial components of feeding difficulties. Among the other scales four deserve special attention. The Children's Eating Behavior Inventory for parents of children aged 2–13 years assesses eight dimensions of eating (responsiveness to food, enjoyment of food, satiety responsiveness, slowness in eating, fussiness, emotional overeating, emotional undereating, and desire for drinks).⁸ Neither sensory factors nor eating skills are assessed. The Mealtime Behavior Questionnaire for children aged 2–6 years has 31 items divided into four sub-scales (food refusal/avoidance, food manipulation, mealtime aggression/distress, and choking/gagging/vomiting).⁹ Sensory factors are not assessed. The Behavior Pediatric Feeding Assessment Scale has 35 items including 25 about child behavior during meals and 10 about parental reactions.¹⁰ The items focus on behavior and provide little information on sensory sensitivity. Finally, the Pediatric Eating Assessment Tool designed for children aged 6 months to 7 years included 78 items divided into four sub-scales (physiologic symptoms, problematic mealtime behaviors, selective/restrictive eating, and oral processing).¹¹ The large number of questions about swallowing contrasts with the absence of items assessing psychological factors. Thus, this tool may be best suited to children with neurological disorders. No French-language versions of these scales have been validated in France.

Our objective was to design a questionnaire for assessing feeding difficulties in young children by exploring four dimensions: behavior during meals, sensory sensitivity, oral skills of the child, and parental anxiety and strategies. We sought to obtain a tool that would not only assess the existence and severity of the disorder but also identify characteristics of use for guiding therapeutic decisions. The tool was to be suitable for both healthy children and children with severe somatic conditions.

What is Known

- Many scales are available for evaluating feeding difficulties in children but most focus on specific populations, ages, or aspects of the condition.
- Children with congenital or chronic disease are at high risk for feeding difficulties.

What is New

- The ORALQUEST tool, the first and only French scale for evaluating feeding difficulties in young children, has four sub-scales (eating behavior, oral skills, sensitivity, and family environment).
- This tool demonstrated robust psychometric properties.
- Feeding difficulties were less common than expected in children with congenital malformations or chronic diseases at high risk for feeding difficulties.

2 | METHODS

2.1 | Ethics statement

This study was approved by our ethics committee (*Comité de Protection des Personnes*, CPP Sud-Est I, #2019-81, ID RCB 2019-A01215-52). All parents gave their written consent. The study was registered on ClinicalTrials.gov (NCT04133038) on 03/03/2020.

2.2 | Description of ORALQUEST

ORALQUEST is a parent-report questionnaire administered by a healthcare professional during a semi-structured interview. The questionnaire includes open-ended and scored items. A clinician reads each question to the parent and writes down the response on the paper or electronic questionnaire. ORALQUEST targets children aged 9 months to 6 years and 11 months.

The open-ended questions are asked at the beginning and end of the interview. Those at the beginning collect data on the parent being interviewed (e.g., educational level, personal opinion about the child's feeding difficulties, and clinical condition of the child). Those asked at the end of the interview seek to identify eating difficulties at any age in the parents, as well as stressful events in the family. These open-ended questions are not scored but are useful for clinicians involved in the care of the child, to understand the feeding difficulties. The other items are scored using a Likert scale (0, never or not true at all; 1, occasionally or slightly true; 2, often or partially true; and 3, always or absolutely true). The items are divided into four dimensions: eating behavior (EB, e.g., appetite and food refusal), oral skills (OS, e.g., chewing, swallowing, and facial motor function), tactile and oral sensitivity (S, e.g., hypersensitivity to textures, odors, or physical contact), and family environment (FE, parental anxiety and strategies). The current situation is considered when scoring the items.

2.3 | Development of ORALQUEST

ORALQUEST was developed by a multidisciplinary team working in a specialized unit for feeding disorders and in a rare-diseases referral center for children with Robin sequence in the Necker University Hospital. They developed the scale according to guidelines by Bruno Falissard.¹² The details of the process are described in Supporting Information: Methods File S1). This process started with 53 questions and left 49 items for the questionnaire.

2.4 | Validation of ORALQUEST: design and population

After characterizing the psychometric properties of the 49-item ORALQUEST, we used this tool to assess several groups of children with somatic conditions at high risk for feeding difficulties and children consulting for feeding difficulties. The inclusion criteria were age 9 months to 6 years and 11 months and evaluation at the Necker University Hospital, either at the multidisciplinary feeding-difficulties clinic or for a somatic condition at high risk for feeding difficulties (esophageal atresia, autism spectrum disorder, complex congenital heart disease, cleft lip and palate, Robin sequence, chromosomal anomalies, or bone-marrow transplant 2 years earlier to treat a congenital immune deficiency). The only exclusion criterion was inability of the parent to understand and read French. All parents had the questionnaire administered by clinicians trained in its use. The inter-rater reliability procedure was done mainly with children who were hospitalized for several days. For the other tests of internal consistency, we tested as many patients as possible without choosing the children.

We enrolled consecutive patients who met our selection criteria between March 3, 2020 and July 31, 2023.

2.5 | Statistical analysis

All statistical analyses were conducted using the R program version 4.2.2 (R Foundation for Statistical Computing, Vienna, Austria). The planned sample size was 300 for structural analyses, in accordance with recommendations by Rouquette and Falissard.¹³ Regarding reproducibility, the planned sample size was 50 for each. Smaller sample sizes (< 300) were also considered sufficient for convergent validity and ROC analyses. The reference measures were administered according to the clinical context and organizational constraints (care setting, family availability, hospitalization or outpatient visit, assessment burden, etc.), without further selecting participants within each setting.

2.5.1 | Item performance and structural validity

Item performance was assessed using three complementary approaches: determination of the proportion of missing data by patient, age, and item; production of score-distribution graphs to detect potential floor or ceiling effects; and analysis of item redundancy using Spearman's correlation coefficients within each sub-scale.

To investigate the underlying structure of the questionnaire, we estimated the number of latent dimensions using a scree plot obtained by principal component analysis. We then performed exploratory factor analysis to examine item loadings. We also used a multitrait-multimethod approach to assess convergent and discriminant validity.

These analyses showed that one EB-domain and five FE-domain items were redundant or not discriminative. Three FE-domain items assessing possible life trauma were used to provide contextual or explanatory information but were not scored since, unlike the scored items, they did not assess the current situation. We thus avoided conflating past traumatic events with current dimensions. Finally, six items were switched from one sub-scale to another and nine were removed. This left 40 items, 10 in the Eating Behavior sub-scale, 9 on the Oral Skills sub-scale, 9 in the Sensitivity sub-scale, and 12 in the Family Environment sub-scale.

All validity assessments were conducted on this 40-item version. Supporting Information: Table S1 lists the keywords.

2.5.2 | Internal consistency

To evaluate internal consistency, we estimated the Cronbach alpha coefficient and its 95% confidence interval (CI). Cronbach alpha values ≥ 0.70 were considered acceptable.¹⁴

2.5.3 | Convergent validity

To evaluate the convergent validity of the total score and of each of the four sub-scores, the parents completed additional questionnaires within a maximum of 3 days after completing ORALQUEST. Spearman's correlation coefficients were computed. The additional questionnaires were the MCHFS for the convergent validity of the total score,⁷ the section of the pediatric symptom checklist on feeding and eating for the EB sub-scale,¹⁵ the Schedule for Oral Motor Assessment (SOMA, children aged 9–24 months)¹⁶ or the Oral Motor Assessment Scale (OMAS, children aged 2–6 years)¹⁷ for the OS sub-scale, the Dunn sensory profile of children aged 7 to 35 months and older than 3 years^{18,19} for the S sub-scale, and the State-Trait Anxiety Inventory (STAI) for the FE sub-scale.²⁰ The SOMA and OMAS were completed by observation of the child by an experienced speech therapist. The other questionnaires were self-administered by the parents. No imputation of missing data was performed, and analyses were conducted using available data.

2.5.4 | Reproducibility

To assess test-retest reliability, ORALQUEST was re-administered to the same parents within 3 weeks of the first administration. Inter-rater reliability was evaluated by having two psychologists each administer the questionnaire to the same parents, on the same day or on two consecutive days. Before the re-test, we asked parents if any change (e.g., hospital admission, surgery, or personal event) had occurred since the first test. We excluded from the analysis the children with such a change (Figure 1). We computed the intraclass correlation coefficient (ICC) with its 95%CI for both test-retest and inter-rater reliability. ICC values > 0.90 were considered excellent.

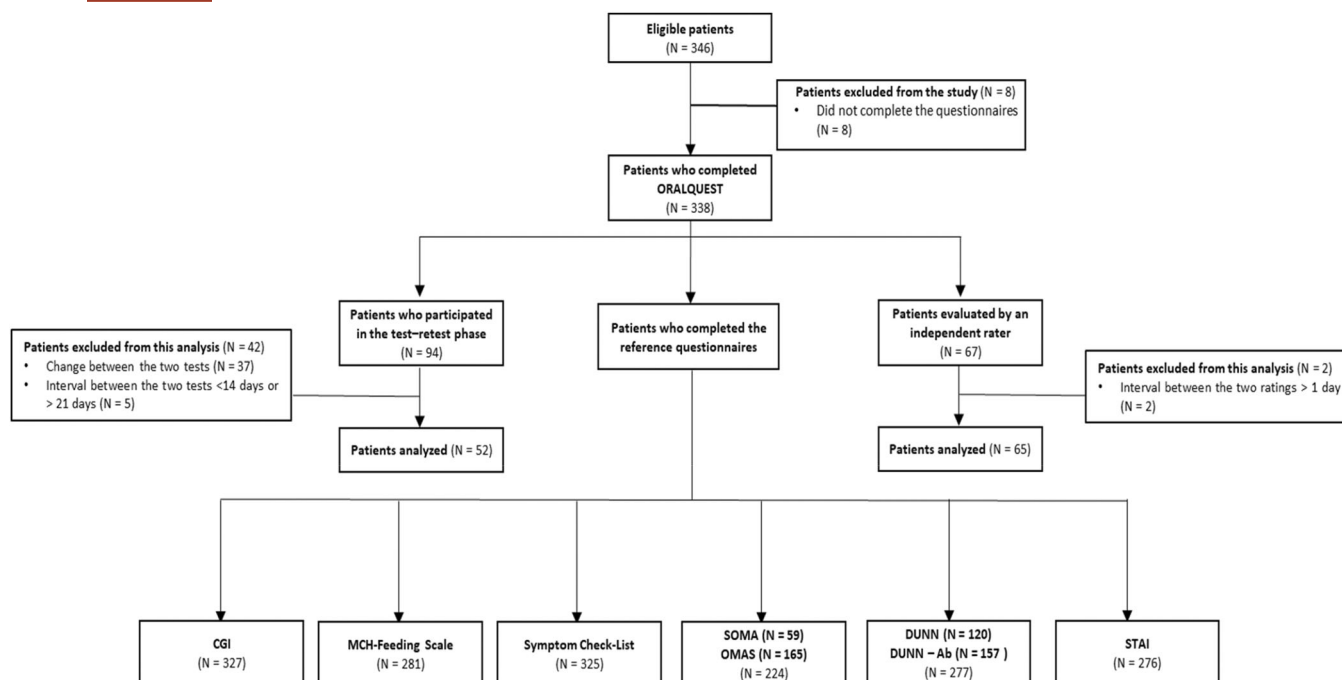


FIGURE 1 Number of patients with completed scales. CGI, Clinical Global Impression; MCHFS, Montreal Children's Hospital Feeding Scale; OMAS, Oral Motor Assessment Scale; SOMA, Schedule for Oral Motor Assessment; STAI, State-Trait Anxiety Inventory.

2.5.5 | Sensitivity/specificity/cutoff

Our reference-standard for diagnosing feeding difficulties (FD) was a combination of three criteria: the parent-reported MCHFS score, with values >60 indicating FD; parent-reported FD described as borderline, mild, moderate, marked, severe or very severe, with characterization as moderate or worse indicating FD; and the clinician's rating of FD on the Clinical Global Impressions (CGI) scale (1, none; 2, borderline; 3, mild; 4, moderate; 5, marked; 6, severe; or 7, extremely severe), with ratings ≥ 3 indicating FD.²¹ The clinician who completed the CGI knew the child well but was not the person who administered the ORAL-QUEST. Children meeting at least two of the three criteria were classified as having FD. To determine the optimal cutoff for the total ORALQUEST score, we plotted the receiver operating characteristic (ROC) curve and estimated the area under the curve (ROC-AUC) and its 95%CI by comparing the total score to the results of patient classification as having FD. The optimal cutoff was determined based on Youden's index, the closest-to-(0,1) criterion, the concordance probability, and the Index of Union method.^{22,23}

3 | RESULTS

3.1 | Patients and prevalence of feeding difficulties

We included 338 children. Table 1 reports their main features. Figure 1 is a flowchart detailing participation in completing additional scales and in the test-retest and inter-rater reliability assessments.

Of the 281 children whose parents completed the MCHFS, 122 (43%) had scores >60. The severity distribution was as

TABLE 1 Characteristics of children in the study ($n = 338$).

Characteristics	
Male	189 (56%)
Age at the study time (months), median (IQR)	37 (9–82)
Birth weight (g), median (IQR)	3020 (565–4830)
Birth length (cm), median (IQR)	49 (25–55)
Low birth weight for the term (<p10)	69 (20.4%)
Premature (<37 WG)	55 (16.3%)
Premature (<33 WG)	20 (5.9%)
Current BMI z score, median (IQR)	−0.5 (−5; +3.6)
Children who had nutritional support in their past	176 (52%)
Children still having a nutritional support at the study time	60 (18%)
Number of children in each group of conditions at risk of feeding disorders	
Consultants for feeding or eating difficulties	74 (21.9%)
Robin sequence	65 (19.2%)
Autism spectrum disorder	52 (15.5%)
Cleft lip and palate	51 (15.4%)
Oesophageal atresia	49 (14.5%)
Complex cardiac malformation	21 (6.2%)
Chromosomal anomalies	14 (4.1%)
Children 2 years after a bone marrow transplant	12 (3.5%)

Abbreviations: BMI, body mass index; IQR, interquartile range; p10, 10 percentile; WG, weeks' gestation.

follows: mild, score 61–65, 43/281 (15%); moderate, score 66–70, 27/281 (10%); and severe, score >70, 52/281 (19%).

According to the parents, 202 (60%) children had feeding difficulties (FD). The severity distribution was as follows: borderline, 18/202 (9%); mild, 30/202 (15%); moderate, 39/202 (19%); marked, 45/202 (22%); severe, 52/202 (26%); and 18/202 (9%), very severe. After exclusion of the 18 children in the borderline category, 184/338 (54%) had feeding FD according to their parents.

The clinician CGI ratings indicated that 232/327 (71%) children had FD, with the following distribution: borderline, 41/232 (18%); mild, 47/232 (20%); moderate, 57/232 (25%); marked, 39/232 (17%); severe, 33/232 (14%); and very severe, 15 (6%). After exclusion of children in the borderline category, 191/327 (58%) of children had FD.

Of the 274 children in whom all three criteria used to define FD were in agreement, 140 (51%) did and 134 (49%) did not have FD. Of the 51 children for whom only two of the three criteria were in agreement, 21 (41%) did and 30 (59%) did not have FD. Thus, according to our reference standard, 161/325 (50%) had FD.

3.2 | Psychometric validation of the scale

3.2.1 | Face validity

None of the 338 questionnaires had missing data, and no ceiling or floor effects were evidenced. Inter-item correlations were

moderate ($r < 0.6$) for all sub-scales except for two S items ($r = 0.62$) and five FE items (Supporting Information: Table S1).

3.2.2 | Structural validity

All item scores showed stronger correlations with their respective sub-scale scores than with scores for other sub-scales (Figure 2 and Supporting Information: Figure S1). Based on the scree-plot, a four-factor solution was most appropriate (Supporting Information: Figure S2). The four-factor solution obtained by exploratory factor analysis broadly confirmed the predefined structure of the ORALQUEST scale, with most items loading strongly on their expected theoretical domains.

3.2.3 | Internal consistency

Internal consistency of the 40-item scale was good. The Cronbach alpha for the overall scale was 0.91 (95%CI, 0.89–0.92) (Supporting Information: Table S2). The coefficients for the EB, OS, S, and FE sub-scales were 0.83, 0.74, 0.72, and 0.87, respectively.

3.2.4 | Convergent validity

The total ORALQUEST score correlated strongly with the MCHFS score ($p = 0.81$), supporting the overall convergent

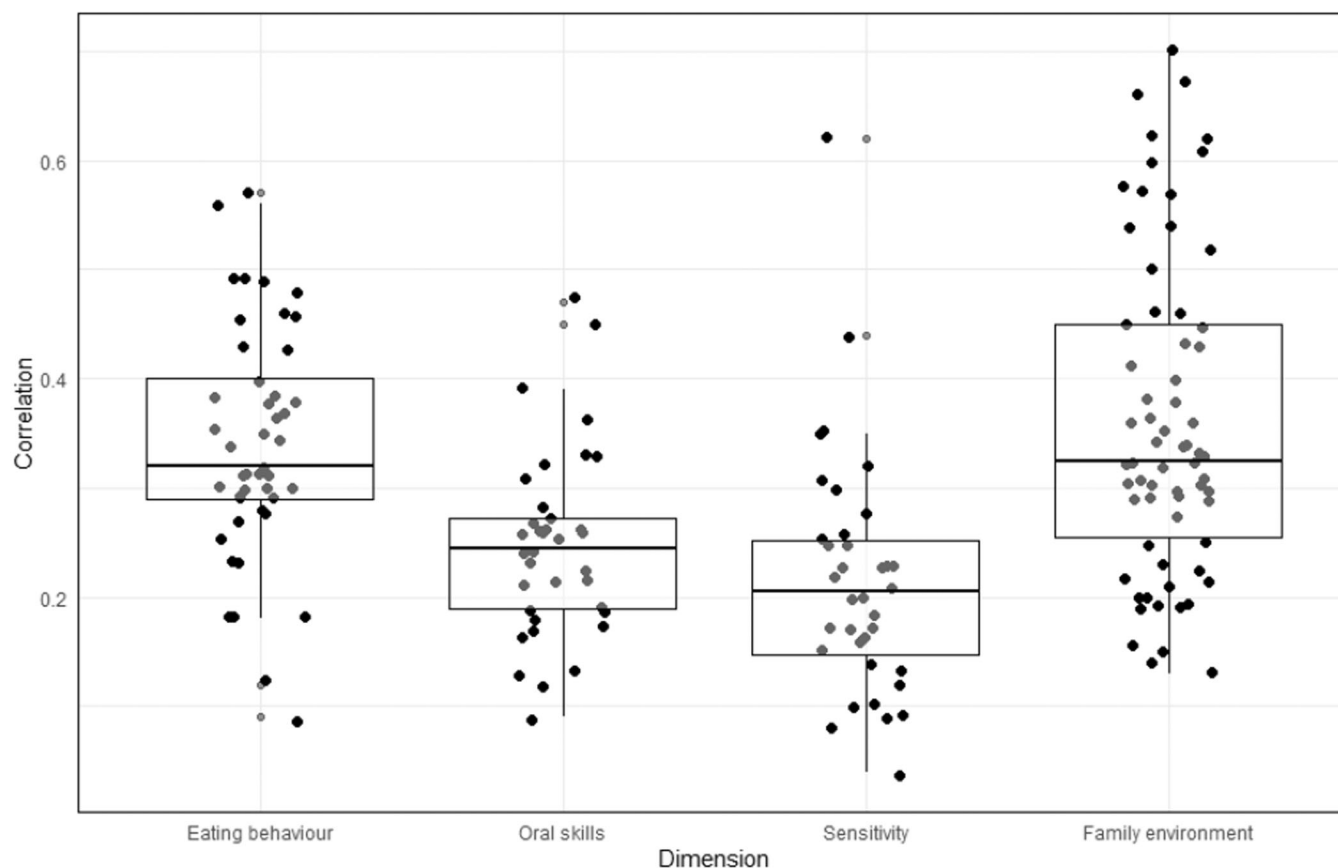


FIGURE 2 Spearman correlations between item scores and sub-scores for each domain. The horizontal line indicates the median, the lower and upper horizontal box edges the 25th and 75th centiles, and the whiskers the range.

validity of the tool. Correlations between each ORALQUEST sub-score and each reference validated scale were good or acceptable ($p = 0.39\text{--}0.53$).

3.2.5 | Reproducibility

Test-retest reliability was assessed for 89 patients. Among them, 37 experienced a change in their life between the two tests, leaving 52 patients for the analysis. The ICC for the total score was 0.93 (95%CI, 0.88–0.96), indicating excellent test–retest reliability. Inter-rater reliability was assessed in 67 patients. The interval between the two ratings was too long for two patients, leaving 65 for the analysis. The ICC was 0.95 (95%CI, 0.92–0.96) indicating strong agreement between raters.

3.2.6 | Sensitivity/specificity/cut-off

Of the 338 patients, 13 could not be classified due to absence of MCHFS, CGI, or parent evaluation data. Of the 325 remaining patients, 161/325 (50%) had FD according to our reference standard. The ROC-AUC was 0.93 (95%CI, 0.90–0.95), indicating excellent discrimination (Supporting Information: Figure S3). The optimal ORALQUEST total-score cutoff for diagnosing FD was 27 according to all four analysis methods. Scores ≥ 27 had 81% (95%CI, 74–87) sensitivity and 88% (95%CI, 82–92) specificity (Supporting Information: Table S3).

3.3 | Results in the overall population and in the groups with specific conditions

Overall, the median total ORALQUEST score was 26, with a wide range, from 1 to 83. Using the cutoff of 27, 154/338 (46%) children had FD. According to the ORALQUEST score, 63 (85%) of the 74 children seen for feeding difficulties had FD. Of the 49 patients with esophageal atresia, only 20 (41%) had FD; corresponding prevalences were 22/52 (42%) for autism spectrum disorder; 20/65 (31%) for Robin sequence, 6/21 (29%) for congenital heart disease, and 9/51 (18%) for cleft lip and palate. The sample sizes of the other two groups were too small for interpretation (Table 2).

Comparing the four sub-scale scores to the total score provides insight into which aspects of feeding are most severely affected. In the group seen for feeding difficulties, the Eating Behavior sub-score made the largest contribution to the total score. The largest contributions were from the Sensitivity sub-score followed by the Eating Behavior sub-score in the autism-spectrum-disorder group; the Eating Behavior and Sensitivity sub-scores in the groups with esophageal atresia, congenital heart disease, and cleft lip and palate; and the Sensitivity, Eating Behavior and Oral Skills sub-scores in the Robin sequence group (Table 2).

4 | DISCUSSION

We developed an original scale in French (ORALQUEST) for detecting and analyzing feeding difficulties in children aged 9 months to 6 years. This scale meets a need, given the high

prevalence of feeding difficulties in young children and the scarcity of clinical research in the field.²⁴ ORALQUEST showed strong structural validity and internal consistency, as well as good convergent validity. Test-retest and inter-rater agreements were excellent. No floor or ceiling effects were evidenced. The cut-off striking the best compromise between sensitivity and specificity was 27; total scores ≥ 27 had 81% sensitivity and 88% specificity for FD. The choice of the gold standard can be criticized first because there is no specific tool for defining FD and second because this series included children with severe congenital disease and parents may consider feeding difficulties minor as compared with other issues. This cut-off has to be reassessed upon completion of the last part of the validation of the scale in the general population. Assessing convergent validity was challenging given the absence of a reference-standard scale suitable for comparison. We chose the validated scales that were most relevant to our tool. The results were excellent for the total score and acceptable for the sub-scores.

The results in our series of children are interesting and somewhat surprising. Of course, the total ORALQUEST score was ≥ 27 for most (85%) children seen for feeding difficulties. That the remaining 15% had lower scores indicates that the perception of feeding difficulties depends on the expectations and tolerance of the parents.²⁵ Among children with somatic conditions, the prevalence of FD as assessed by the ORALQUEST score was lower than expected: 42% for children with Autism, 41% for children with oesophageal atresia, 31% for Robin sequence, 18% for cleft palate. One possible explanation is that our cutoff may be too high. Also, all the data except the CGI ratings came from the parents, who may have underestimated the feeding difficulties. Moreover, as specialists of feeding difficulties, we missed out on children who were doing well and focused on those who had difficulties that we estimated as complications of the condition. It is reassuring that many of these high-risk children did not have FD. Each cohort will be interesting to re-evaluated with the final version of the tool and with larger samples.

As expected, hypersensitivity was the main factor in the feeding difficulties of children with autism. This symptom was also a major factor in children with esophageal atresia, congenital heart disease, and cleft palate, who had experienced pain and discomfort during their neonatal surgical pathway. Also as expected, poor feeding skills had a strong effect in patients with Robin sequence or neurological disorders.

Our study has several limitations. First, our three-criterion method for defining FD may be criticizable, notably because the parents of children with congenital malformations may deem the feeding difficulties unremarkable compared to other symptoms. Of the three criteria, only the CGI rating was independent from parents' perceptions. Second, the entire protocol was long and may be parent's fatigue may have introduced a bias in the results. Third, the sizes of the seven disease groups were small. Finally, the scale was developed in France and our results may not be generalizable to other countries and cultures.

5 | CONCLUSION

The ORALQUEST scale performed well for evaluating feeding difficulties in children aged 9 months to 6 years. This scale, constructed and validated in France, should

TABLE 2 ORALQUEST scores for the whole population and sub-groups of specific disease ($n = 338$).

	Total score	Oralquest score ≥ 27	Behaviour sub-score	Oral skills sub-score	Sensitivity sub-score	Family environment sub-score
Consulting for feeding difficulties ($n = 74$)		$n = 63$ (85%)				
Mean (SD)	41 (13)		56 (18)	35 (19)	34 (23)	39 (22)
Median (IQR)	41 (32–48)		57 (42–70)	30 (22–48)	30 (19–52)	33 (22–58)
Range	(18–73)		(3–90)	(0–78)	(0–93)	(0–94)
Robin sequence ($n = 65$)		$n = 20$ (31%)				
Mean (SD)	21 (14)		24 (17)	22 (20)	25 (20)	14 (16)
Median (IQR)	21 (10–30)		20 (10–37)	15 (7–30)	22 (7–33)	8 (3–19)
Range	(1–61)		(0–63)	(0–81)	(0–67)	(0–67)
ASD ($n = 52$)		$n = 22$ (42%)				
Mean (SD)	28 (15)		31 (19)	17 (17)	33 (17)	28 (23)
Median (IQR)	26 (18–37)		30 (17–43)	11 (4–26)	33 (22–44)	25 (8–43)
Range	(7–79)		(0–80)	(0–74)	(4–70)	(0–97)
Cleft lip and palate ($n = 51$)		$n = 9$ (18%)				
Mean (SD)	18 (11)		21 (19)	12 (12)	28 (19)	12 (14)
Median (IQR)	14 (9–26)		13 (7–30)	7 (4–15)	26 (9–44)	8 (3–17)
Range	(2–51)		(0–77)	(0–59)	(0–70)	(0–61)
Oesophageal atresia ($n = 49$)		$n = 20$ (41%)				
Mean (SD)	26 (17)		28 (21)	21 (20)	30 (23)	25 (22)
Median (IQR)	23 (13–35)		20 (10–43)	22 (4–33)	26 (11–44)	17 (8–44)
Range	(2–83)		(0–83)	(0–70)	(0–100)	(0–86)
Cardiac malformation ($n = 21$)		$n = 6$ (29%)				
Mean (SD)	25 (17)		28 (26)	22 (20)	28 (15)	22 (23)
Median (IQR)	20 (15–30)		20 (10–37)	11 (11–33)	30 (22–33)	17 (8–31)
Range	(7–63)		(0–87)	(0–67)	(0–63)	(0–86)
Chromosomal anomaly ($n = 14$)		$n = 12$ (86%)				
Mean (SD)	45 (17)		54 (22)	44(17)	37 (25)	45 (29)
Median (IQR)	41 (31–51)		53 (37–66)	48 (38–56)	30 (17–50)	42 (22–61)
Range	(17–76)		(23–87)	(11–63)	(7–78)	(0–94)
Bone marrow transplant ($n = 12$)		$n = 2$ (17%)				
Mean (SD)	17 (15)		25 (22)	12 (10)	15 (20)	16 (17)
Median (IQR)	12 (7–21)		18 (7–33)	11 (6–12)	4 (4–26)	10 (4–26)
Range	(3–55)		(3–70)	(0–37)	(0–59)	(0–56)

Abbreviations: ASD, autism spectrum disorder; IQR, interquartile range; SD, standard deviation.

prove helpful given the substantial prevalence of feeding difficulties and PFD in young children and the frequent uncertainty among healthcare providers about how to address them.²⁶ The Goday's PFD framework is very useful for the medical approach, but scales such as the ORALQUEST are complementary to it, helping to characterize the child and target his/her treatment et rehabilitation.

ACKNOWLEDGMENTS

We thank all the families that helped us reflect on feeding difficulties and develop and validate ORALQUEST. We thank Laura Smales and Aria Wolfe for their help with the English writing and editing. The work of the psychologist Béatrice Thouvenin was supported by a Research grant from the TETECO rare disease health national network. Open access publication funding provided by COUPERIN CY26.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ORCID

Véronique Abadie  <https://orcid.org/0000-0002-3525-1921>

REFERENCES

- Rogers S, Ramsay M, Blissett J. The Montreal Children's Hospital Feeding Scale: relationships with parental report of child eating behaviours and observed feeding interactions. *Appetite*. 2018;125:201-209. doi:10.1016/j.appet.2018.02.007
- Goday PS, Huh SY, Silverman A, et al. Pediatric feeding disorder: consensus definition and conceptual framework. *J Pediatr Gastroenterol Nutr*. 2019;68(1):124-129. doi:10.1097/MPG.0000000000002188
- DSM5 Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition, Text Revision (DSM-5-TR™), American Psychiatric Association, Ed. Amer Psychiatric Pub Inc. 2022.
- Raven Morris N, Daw H, Bates L, Horniblow RD. Utilising the diagnostic criteria of paediatric feeding disorder: updated findings from a population-based cohort study. *J Pediatr Gastroenterol Nutr*. 2025;82(1):33-41. doi:10.1002/jpn3.70258
- Pergeline H, Gonnet L, Fernandez A, Solla F, Poinso F, Guivarch J. Diagnosis and treatment of pediatric feeding disorders: a narrative literature review. *Children*. 2025;12(3):333. doi:10.3390/children12030333
- Heckathorn DE, Speyer R, Taylor J, Cordier R. Systematic review: non-instrumental swallowing and feeding assessments in pediatrics. *Dysphagia*. 2016;31(1):1-23. doi:10.1007/s00455-015-9667-5
- Ramsay M, Martel C, Porporino M, Zygmuntowicz C. The Montreal Children's Hospital Feeding Scale: a brief bilingual screening tool for identifying feeding problems. *Paediatr Child Health*. 2011;16(3):147-e17, e16-e17. doi:10.1093/pch/16.3.147
- Archer LA, Rosenbaum PL, Streiner DL. The children's eating behavior inventory: reliability and validity results. *J Pediatr Psychol*. 1991;16(5):629-642. doi:10.1093/jpepsy/16.5.629
- Berlin KS, Davies WH, Silverman AH, Woods DW, Fischer EA, Rudolph CD. Assessing children's mealtime problems with the Mealtime Behavior Questionnaire. *Children's Health Care*. 2010;39:142-156. doi:10.1080/02739615.2024.2405216
- Crist W, Napier-Phillips A. Mealtime behaviors of young children: a comparison of normative and clinical data. *J Dev Behav Pediatr*. 2001;22(5):279-286. doi:10.1097/00004703-200110000-00001
- Thoyre SM, Pados BF, Park J, et al. Development and content validation of the Pediatric Eating Assessment Tool (Pedi-EAT). *Am J Speech Lang Pathol*. 2014;23:46-59. doi:10.1044/1058-0360(2013)12-0069
- Falissard B. Mesurer la subjectivité en santé - Perspective méthodologique et statistique. Ed Masson Abrégés, 2008.
- Rouquette A, Falissard B. Sample size requirements for the internal validation of psychiatric scales. *Int J Methods Psychiatr Res*. 2011;20(4):235-249. doi:10.1002/mpr.352
- Primer A, Boateng GO, Neilands TB, Frngillo EA, Melgar-Quinonez HR, Young SL. Best practices for developing and validating scales for health, social, and behavioral research. *Front Public Health*. 2018;6(149):1-12. doi:10.3389/fpubh.2018.00149
- Jellinek MS, Murphy JM, Robinson J, Feins A, Lamb S, Fenton T. Pediatric symptom checklist: screening school-age children for psychosocial dysfunction. *J Pediatr*. 1988;112(2):201-209. doi:10.1016/s0022-3476(88)80056-8
- Skuse D, Stevenson J, Reilly S, Mathisen B. Schedule for oral-motor assessment (SOMA): methods of validation. *Dysphagia*. 1995;10(3):192-202. doi:10.1007/BF00260976
- De Oliveira Lira Ortega A, Ciamponi AL, Mendes FM, Santos MTBR. Assessment scale of the oral motor performance of children and adolescents with neurological damages. *J Oral Rehabil*. 2009;36(9):653-659. doi:10.1111/j.1365-2842.2009.01979.x
- Dunn W. *Infant/Toddler Sensory Profile User's Manual*. Ed. Elsevier. 2002.
- Dunn W, Westman K. The sensory profile: the performance of a national sample of children without disabilities. *Am J Occup Ther*. 1997;51(1):25-34. doi:10.5014/ajot.51.1.25
- Speilberger CD, Gorsuch RL, Lushene RE, Vagg PR, Jacobs g. *Manual for the State-Trait Anxiety Inventory (Form Y)*. Consulting Psychologists Press; 1983.
- Guy W. *Clinical Global Impression. ECDEU Assessment Manual for Psychopharmacology -Revised*. US Department of Health, Education, and Welfare, Public Health service, Alcohol, Drug Abuse, and Mental Health Administration, NIMH; 1976.
- Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability. *J Chiropr Med*. 2016;15(2):155-163. doi:10.1016/j.jcm.2016.02.012
- Unal I. Defining an optimal cut-point value in ROC analysis: an alternative approach. *Comput Math Methods Med*. 2017;2017:1-14. doi:10.1155/2017/376265
- Rosen R. Prevalence of feeding disorders: a tough reality to swallow. *J Pediatr*. 2021;228:13-14.
- Kerzner B, Milano K, MacLean WC, Berall G, Stuart S, Chatoor I. A practical approach to classifying and managing feeding difficulties. *Pediatrics*. 2015;135(2):344-353. doi:10.1542/peds.2014-1630
- Kovacic K, Rein LE, Szabo A, Kommareddy S, Bhagavatula P, Goday PS. Pediatric feeding disorder: a nationwide prevalence study. *J Pediatr*. 2021;228:126-131.e3. doi:10.1016/j.jpeds.2020.07.047

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Thouvenin B, Ould-Ammar R, Ouss L, et al. Development and validation of the new French ORALQUEST scale for evaluating feeding difficulties in young children. *J Pediatr Gastroenterol Nutr*. 2026;1-8. doi:10.1002/jpn3.70491