

## Clinical use of a food inventory to identify maternal underreport on children's food intake: experience of a reference center in Brazil

### Uso clínico do inventário alimentar para identificação do sub relato materno sobre ingestão alimentar em crianças: experiência de centro de referência brasileiro

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Recibido: 11/enero/2018. Aceptado: 22/abril/2018.

#### ABSTRACT

**Background:** Feeding Difficulties (FD) are a common problem in childhood, and dietary assessments are extremely important to evaluate food consumption and selectivity patterns. In clinical practice, it is often observed that caregivers have an exacerbated perception of the severity of their children's FD and this may impact on dietary reports.

**Objectives:** To compare the variety of foods consumed by children with FD under maternal perception to the evaluation performed by nutritionist using a food inventory in association with traditional methods.

**Methods:** It is a cross sectional study with 119 mother-children pairs, with complaints of FD followed at an outpatient service in São Paulo, Brazil. Data collected consisted of demographics, maternal caregiving style, responsibility over feeding the child, perception of children's feeding diversity (expressed in numbers, taken from a self-explanatory food inventory), presence of organic disease, type of FD, BMI Z-score, and actual repertoire of foods consumed (expressed in numbers, assessed by the nutritionist after evaluating the food inventory). The inventory provided information about

the food items the child accepts without rejection, used to accept but now rejects, and completely rejects. Spearman correlation and Lynn's coefficient of variation, ANOVA and T-student tests were used, with a 5% significance level.

**Results and discussion:** Overall food diversity ranged from 16 (p25%) to 30 (p75%) different types of foods. Maternal perceived food diversity ranged from 4,3 to 14,5 (p25-75). Around 23,7% of children were considered highly selective (less than 15 types of foods) ( $p=0,000$ ). Maternal perception underestimated that assessed by the nutritionist in 2,2 times, with low reproducibility between these two variables ( $r=0,14$ ). Both maternal perception and professional assessment did not vary according to age, organic comorbidities, gender, maternal parity, feeding style or responsibility over feeding routines ( $p>0,49$ ). Findings enhance the importance of parental behavioral interventions and of the use of dietary research methodologies which are complementary to already validated strategies.

**Conclusions:** There was maternal underestimation on the quantity of foods accepted by children with FD. The data reinforce the need for family orientation about the expectations regarding the feeding practices and preferences of their children.

#### KEYWORDS

Feeding difficulties, children, food inventory, dietary assessment, nutrition evaluation

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## RESUMO

**Introdução:** As dificuldades alimentares (DA) são um problema comum na infância, e a avaliação dietética é extremamente importante para avaliar o consumo de alimentos e os padrões de seletividade. Na prática clínica, muitas vezes observa-se que os cuidadores têm percepção exacerbada da gravidade da DA de seus filhos, e isso pode afetar os relatos alimentares.

**Objetivos:** comparar a variedade de alimentos consumidos por crianças com DA sob percepção materna à avaliação realizada por nutricionista, usando um inventário de alimentos em associação com métodos tradicionais.

**Métodos:** Estudo transversal com 119 pares de mãe-filho, com queixas de DA atendidos em ambulatório em São Paulo, Brasil. Coletou-se dados demográficos, estilo parental materno, responsabilidade sobre a alimentação da criança, percepção da diversidade de alimentação das crianças (expressa em números, extraída de inventário de alimentos auto-preenchido), presença de doença orgânica, tipo de DA, IMC escorez, e repertório real de alimentos consumidos (expresso em números, avaliado pelo nutricionista depois de avaliar o inventário de alimentos). O inventário forneceu informações sobre alimentos que a criança aceita sem rejeição, costumava aceitar, mas agora rejeita, e rejeita completamente. Utilizou-se correlação de Spearman e coeficiente de variação de Lynn, ANOVA e Teste T-student, com nível de significância de 5%.

**Resultados e discussão:** a diversidade geral de alimentos variou de 16 (p25%) a 30 (p75%) tipos de alimentos. A percepção materna variou de 4,3 a 14,5 (p25-75). Cerca de 23,7% das crianças foram consideradas altamente seletivas (menos de 15 tipos de alimentos) ( $p = 0,000$ ). A percepção materna subestimou a avaliação do nutricionista em 2,2 vezes, com baixa reprodutibilidade entre as duas variáveis ( $r = 0,14$ ). Tanto a percepção materna como a avaliação profissional não variaram de acordo com a idade, comorbidades orgânicas, gênero, paridade materna, estilo parental ou responsabilidade sobre as rotinas de alimentação ( $p > 0,49$ ). Os achados reforçam a importância das intervenções comportamentais com os pais e do uso de metodologias de investigação dietética complementares às estratégias já validadas.

**Conclusões:** houve subestimação materna sobre a quantidade de alimentos aceitos por crianças com DA. Os dados reforçam a necessidade de orientação familiar sobre as expectativas quanto às práticas de alimentação e preferências de seus filhos.

## PALAVRAS-CHAVE

Dificuldades alimentares, crianças, inventário de alimentos, avaliação dietética, avaliação nutricional

## BACKGROUND

Having a healthy diet is not only about consuming the right quantity, but the right variety of foods to guarantee nutrients, and – therefore - the proper functioning of the metabolism and the prevention of diseases caused by poor diet. Once eating habits are molded during childhood, it is essential to offer a varied diet, so children can develop their taste and maintain healthy eating patterns, which will ensure their development and growth until adult life<sup>1</sup>.

Feeding difficulties are a common problem in childhood, often beginning with natural neophobic and picky eating behaviors, which tend to diminish after 6 years old. They affect up to 50% of children, depending on the criteria of diagnosis, and these perceived problems cover a wide range of symptoms, from mild feeding difficulties to severe problems, the latter representing only 1% to 5% of the cases (as seen in autism spectrum disorders)<sup>2</sup>. Since children's eating patterns are determined by food references – naturally pointed for sugar, fat and salt rich foods; such restrictive behaviors imply almost every time on decreased amount and/or variety of food, which – both for caregivers and health professionals - is a reason of preoccupation, guilt and powerlessness feelings<sup>1,2,3</sup>. Jacobi et al. (2008)<sup>4</sup>, for example, found out that dairy products, fruits, vegetables, meat, fish, fast food, noodles/potatoes/rice and beverages are avoided more often by picky eaters than non-picky. In general, most of studies point out a lower intake of fruits, vegetables and meat among selective children<sup>2,3,5,6</sup>. According to Kerzner et al., 2015<sup>3</sup>, a child is considered highly selective when he/she limits the diet to 10 to 15 foods. Amongst children with feeding difficulties, approximately 20% are misperceived to have this problem<sup>2</sup>.

Although children's picky eating behaviors are based mostly on these attributes mentioned above, there can be several other types of behaviors, such as having a strong preference for foods and types of preparations, rejection of specific groups of foods, and avoidance to try new foods. Despite being a complex concept, caregivers' perception of children's behaviors is still the main tool for diagnosis, considering their awareness of feeding difficulties or pickiness, or a list of questions about eating behaviors and feeding practices<sup>7,8</sup>. In fact, caregivers' perception and behaviors while facing FDs can reinforce or even provoke restrictive food intake if a negative atmosphere is created around mealtimes<sup>3,9</sup>. Concerned about the lack of nutrients in their children's diet, parents can make use of coercive or indulgent practices (such as persuasion, excessive control, rewarding and blackmailing, preparation of special dishes, etc.); and such uses of pressure can cause the opposite effect, turning their diet poorer<sup>10,11</sup>.

Dietary assessments are extremely important tools to evaluate food consumption in these cases, but there is no perfect method - especially in pediatrics - since it is the caregiver who gives the report<sup>2</sup>. Currently, the major survey methods vali-

dated for use with pediatric populations and used in the literature are the 24-hour Dietary Recall (24HR), Food Frequency Questionnaire (FFQ), as well as the prospective method entitled Dietary Record (DR, usually a record of three nonconsecutive days), all of them filled by parents/caregivers in case of children<sup>12,13,14</sup>. Among the limitations of each method, the underreporting of food intake is frequently cited, given the dependency of memory by the respondent (24HR e FFQ)<sup>12</sup>. Beyond the traditional survey methods, a series of other instruments can be used to characterize dietary routines and selective feeding behaviors of children, addressing general behaviors of food intake<sup>8,12</sup>. They do not – however - characterize thoroughly children's acceptance and refusal patterns *per se*, due to its generic behavioral nature. Thus, the nutritionist who works in the field of feeding difficulties must be aware of the inherent errors of each method and preferentially combine different ones to have a more reliable report on the child's food consumption.

In clinical practice, it is often observed that caregivers have an exacerbated perception of the severity of their children's FD, which results in coercive practices and reinforcement of restrictive patterns of eating. Understating and confronting parental perception may be an initial step towards predicting potentially modifiable factors for the development of children's healthy eating habits; and health professionals can proceed with in-depth investigation or specialized treatment if needed. Therefore, the aim of the present study is to compare the variety of foods consumed by children with feeding difficulties under maternal perception to the evaluation performed by nutritionist, using traditional dietary assessment methods associated with a food inventory developed for supplementary use.

## METHODS

### **Study design and population**

It is a cross sectional study, carried out in the Centro de Dificuldades Alimentares (CDA) - an outpatient service dedicated to support children and teenagers between 0 and 18 years old, with complaints of FD (excluding cases of psychiatric eating disorders diagnosed according to DSM-5<sup>15</sup>). The center is part of Instituto PENSI/Hospital Infantil Sabará/Fundação José Luiz Egydio Setúbal, located in São Paulo, Brazil. Sampling was assembled by convenience, with the inclusion of all patients up to the moment of data collection (Aug/2014 to Mar/2017; n=119). All patients presented written consent forms signed by their responsible caregiver, after ethical approval of the project (CAAE 32939314.0.0000.5567; approval granted in 13/08/2014 under document n. 808.394).

### **Data collection**

The protocol adopted at CDA consists of a joint appointment with a pediatrician, speech therapist and nutritionist,

followed by a multidisciplinary discussion of each case. Each child is diagnosed as to the type of FD according to the criteria suggested by Kerzner et al<sup>3</sup>. Families receive then a feedback, with indication of a therapeutic plan designed by each specialty, such as diet plans and nutritional education activities, medication, stimulation and reestablishment of oral functions or even referral to other professionals from other areas. Several subsequent follow up appointments may be scheduled after this, as suggested by the multidisciplinary team. Nevertheless, data was always collected at the initial appointment at the Centre. The guidelines used by each specialty were defined according to standards for age, and are described by Maximino P., et al (2016)<sup>16</sup>.

To investigate feeding routines and food intake of children, parents and/or caregivers were properly oriented to fill in at home a Dietary Record of three non-consecutive days, being necessarily one weekend day, in addition to a food inventory (both self-report instruments). The inventory was developed by CDA team for clinical use to support the investigation of patients feeding habits, providing information about the food items the child accepts without rejection, the ones he/she used to accept but now rejects (for whichever reasons) and finally the ones he/she completely rejects. The inventory is filled by caregivers based on their perception about the food intake of their children: they are oriented to freely list the foods/culinary preparations for each presented category (Figure 1). This way, the categorization allows to trace the child's food diversity and the pattern of food refusal.

At the initial appointment, the nutritionist uses all data from the Dietary Record to calculate the dietary intake and obtain relevant information on the child's feeding routines. The inventory brought by the caregiver is then confronted to the professional's analysis, composed by 1) aleatory and spontaneous information about the food intake, which emerge during the appointment; 2) crossing information in the Dietary Record which may not be present in the inventory; and 3) freely questioning about the acceptance of several types of foods, according to textures, colors, flavors and food groups. After this analysis, any reports which may have been omitted during the self-report are added by the nutritionist to the instrument (with proper identification). After this complementation, it is possible to account and compare the variety of foods reported by caregivers and analyzed by the nutritionist, stratified in the same categories.

The collected information from these appointments was then reported in the child's medical records, from which the following variables were selected:

- Caregiver (mother): age (years), parity, caregiving style (according to criteria suggested by Hughes et al (2005))<sup>17</sup>; responsibility over feeding the child; and perception of children's feeding diversity (expressed in numbers, it represents variety of different foods the child ac-



**Figure 1.** Example of food inventory developed by CDA team. Instituto PENSI, 2017.

FUNDAÇÃO José Luiz Evelyn Schubert Sabará Instituto PENSI

Nome da criança \_\_\_\_\_ Data de nascimento 05,02,2017

Data do preenchimento 09,12,2017

### LISTA DOS ALIMENTOS

| ALIMENTOS QUE ACEITA  | ALIMENTOS QUE JÁ PROVOU, MAS NÃO COME MAIS (DEIXOU DE COMER)  | ALIMENTOS QUE A FAMÍLIA OFERECE, MAS REJEITA TOTALMENTE   |
|---|---|---|
| - biscoito de amarelo, <sup>Ⓢ</sup><br>churrasco, <sup>Ⓢ</sup><br>- arroz, <sup>Ⓢ</sup><br>- pão, <sup>Ⓢ</sup><br>- gelatina, <sup>Ⓢ</sup><br>- todo tipo de fruta, <sup>Ⓢ</sup><br>sem açúcar (Abacaxi,<br>manga, melancia, maçã,<br>pera etc...<br>- batatas de água e<br>sal (não gosto de cozida)<br>- todo tipo de suco, <sup>Ⓢ</sup><br>natural<br>- Merguez amado, <sup>Ⓢ</sup><br>- batata doce amada, <sup>Ⓢ</sup><br>milho cozido, <sup>Ⓢ</sup> | Arroz, feijão, carnes,<br>purês (diversos de batatas,<br>mandiocquinha, de batata<br>doce)<br>Sopa, antes comia<br>até beterraba<br>- macarrão<br>- tomate<br>- biomagista<br>- Água ele bebe muito<br>pouco, tem que forçar<br>para beber água de<br>coco<br>batata frita, <sup>Ⓢ</sup><br>leite (composto lácteo), <sup>Ⓢ</sup><br>Pãozinho, <sup>Ⓢ</sup> | - arroz, feijão<br>- carne<br>- salada<br>- Sopa<br>- Macarrão<br>- Água<br>Todos os refeições da<br>família ele não aceita*<br>chocolate, <sup>Ⓢ</sup> <span style="float: right;">vaca em pizza</span><br>leite, <sup>Ⓢ</sup> <span style="float: right;">pão de queijo</span><br>bolo de leite, <sup>Ⓢ</sup> <span style="float: right;">melancia de</span><br>bolo de leite, <sup>Ⓢ</sup> <span style="float: right;">melancia de</span><br>milho puro, <sup>Ⓢ</sup> <span style="float: right;">chocolate</span><br>fango imperado, <sup>Ⓢ</sup><br>bolo de leite de fruta, <sup>Ⓢ</sup> |

Translation: The upper part of sheet consists on patients' identification; left column states "accepted foods"; middle column states "foods which the child has accepted once, but no longer does"; right column states "foods which are completely rejected".

cepts to eat according to the mother's perception, taken from the self-explanatory food inventory).

- Children: age (months), gender, organic disease accompanying feeding complaints, type of FD, BMI Z-score (evaluated according to WHO standards), and actual repertoire of foods consumed, hereby expressed by "feeding diversity" (expressed in numbers, representing the real amount of foods the child accepts to eat. This information was obtained during the interview with the nutritionist through the dietetic assessment, explained previously).

### Statistical Analysis

Consistency of data was evaluated, and statistical analysis was performed by SPSS v21 software. Descriptive analysis was conducted through frequency of distribution (%), quartiles (p25% and p75%), and average ± standard deviation. Spearman correlation and Lynn's coefficient of variation ( $r > 0,8$ ) were used to test the reliability between mothers' perception of feeding diversity and data obtained from nutritionist assessment. ANOVA and T-student tests were used to check for associations between the remaining variables and the information given by mothers, with a 5% significance level.

### RESULTS

Population consisted mostly of male children, grouped mainly between 2 to 5 years old (p25% 23m; p75% 61m),

and with a normal BMI (p25% -0,77; p75% +0,54). The most frequent type of FD diagnosed was picky eating, accompanied by organic causes in about 1/3 of population. Half of children assessed ranged their food diversity from 16 (p25%) to 30 (p75%) different types of foods. As of the mothers, age group varied between 33 (p25%) and 41 years old (p75%), and they were mostly primiparous women. Only about 1/3 of mothers were classified as responsive caregivers (authoritative style), and more than half of them were responsible for the child feeding routines. The perceived food diversity of their children ranged from 4,3 to 14,5 different types of foods (p25-75). Detailed characteristics of the population are described in Table 1.

From the 76 children whose food diversity was available for assessment, only 18 (23,7%) were considered highly selective, there is, they eat less than 15 types of foods. The average of food diversity reported by mothers to highly selective children was  $8,8 \pm 9,5$  types of foods (vs  $10 \pm 3,7$  in nutritionist assessment), while to (regular) selective children it was  $10,8 \pm 8,7$  (vs  $27,7 \pm 9$  in nutritionist assessment). No statistical difference was found when comparing maternal reports ( $p=0,66$ ), but highly selective children do tend to eat less variety of foods ( $p=0,000$ ) when assuming the assessment performed by the nutritionist. In both groups, there was underestimation of reports in maternal speech compared to professional assessment. In the group of (regular) selective children, the underreport is 2,6 times lower.

**Table 1.** Main characteristics of population. Instituto PENSI:2017.

| Variable   | (% [N] or mean $\pm$ SD) |
|--|--------------------------|
| <b>Children</b>  |                          |
| <b>Age (months) (n=119)</b>                                    | 49,7 $\pm$ 39,1          |
| <b>Gender (n=119)</b>  |                          |
| Male   | 67,2% (80)               |
| Female   | 32,8% (39)               |
| <b>BMI Z-score (n=75)</b>                                      | -0,19 $\pm$ 1,3          |
| <b>Organic disease accompanying feeding complaints (n=116)</b> | 31% (36)                 |
| <b>Type of FD (n=119)</b>                                      |                          |
| Agitated   | 3,4% (4)                 |
| Limited appetite   | 17,6% (21)               |
| Phobia   | 6,7% (8)                 |
| Misinterpretation of caregivers                                | 17,6% (21)               |
| Organic causes   | 10,1% (12)               |
| Picky eaters   | 37,8% (45)               |
| Other causes   | 6,7% (8)                 |
| <b>Food diversity assessed by nutritionist (n=76)</b>          | 23,4 $\pm$ 11            |
| <b>Caregiver (mother)</b>                                      |                          |
| <b>Age (years) (n=101)</b>                                     | 36,9 $\pm$ 5,2           |
| <b>Parity (n=117)</b>  |                          |
| First born child   | 74,4% (87)               |
| Multiple children  | 25,6% (30)               |
| <b>Caregiving style (n=103)</b>                                |                          |
| Authoritarian  | 34% (35)                 |
| Authoritative  | 27,2% (28)               |
| Indulgent  | 30,1% (31)               |
| Negligent  | 8,7% (9)                 |
| <b>Responsibility over feeding routines (n=106)</b>            |                          |
| Parents  | 57,5% (61)               |
| Grandparents   | 23,6% (25)               |
| Baby sitters   | 18,9% (20)               |
| <b>Maternal Perceived Food diversity (n=36)</b>                | 10,7 $\pm$ 9             |

In average, the maternal perception of what the child eats underestimated that assessed by the nutritionist in 2,2 times. Spearman correlation shows (Figure 2) poor association ( $r=0,41$ ) between food diversity assessed and that described by mothers; being later confirmed by Lynn's coefficient of variation ( $r=0,14$ ), which reinforces the low reproducibility between these two variables.

It has also been found lack of association between maternal perception and maternal age (R Spearman = 0,09) or child's age (R Spearman = 0,24). The ANOVA test confirmed lack of association between maternal reports and children's organic comorbidities ( $p=0,72$ ) or gender ( $p=0,49$ ); maternal parity ( $p=0,86$ ), feeding style ( $p=0,58$ ) or responsibility over feeding routines ( $p=0,85$ ). When the professional assessment was tested according to the same variables, no association was confirmed either ( $p>0,05$ ). Despite the lack of associations found, mothers with non-responsive caregiving styles and whose children presented comorbidities were described as the lowest food diversity reports; while presence of comorbidities and maternal responsibility over feeding routines were the variables with least food diversity in the professional assessment. Comparisons are demonstrated in Figure 3.

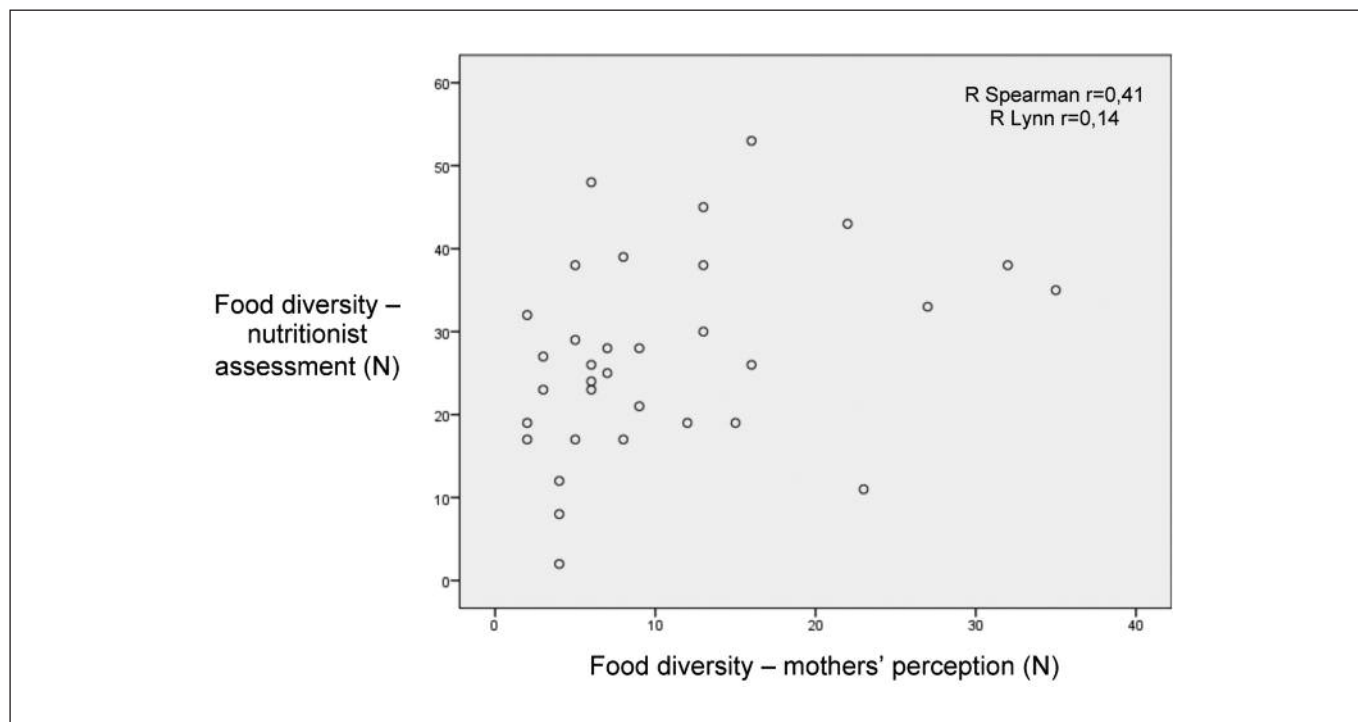
The FD diagnosis was the only variable associated to maternal perception ( $p=0,019$ ), in which phobic diagnosis showed the lowest maternal reports for food diversity. This result has also been found when the variable for food diversity assessed by professionals ( $p=0,016$ ). Despite the low correlation between maternal and professional perceptions regarding food diversity previously mentioned, patterns of food acceptance/refusal tended to follow a similar pattern when distributed by types of FD, as demonstrated in Figure 4.

## DISCUSSION

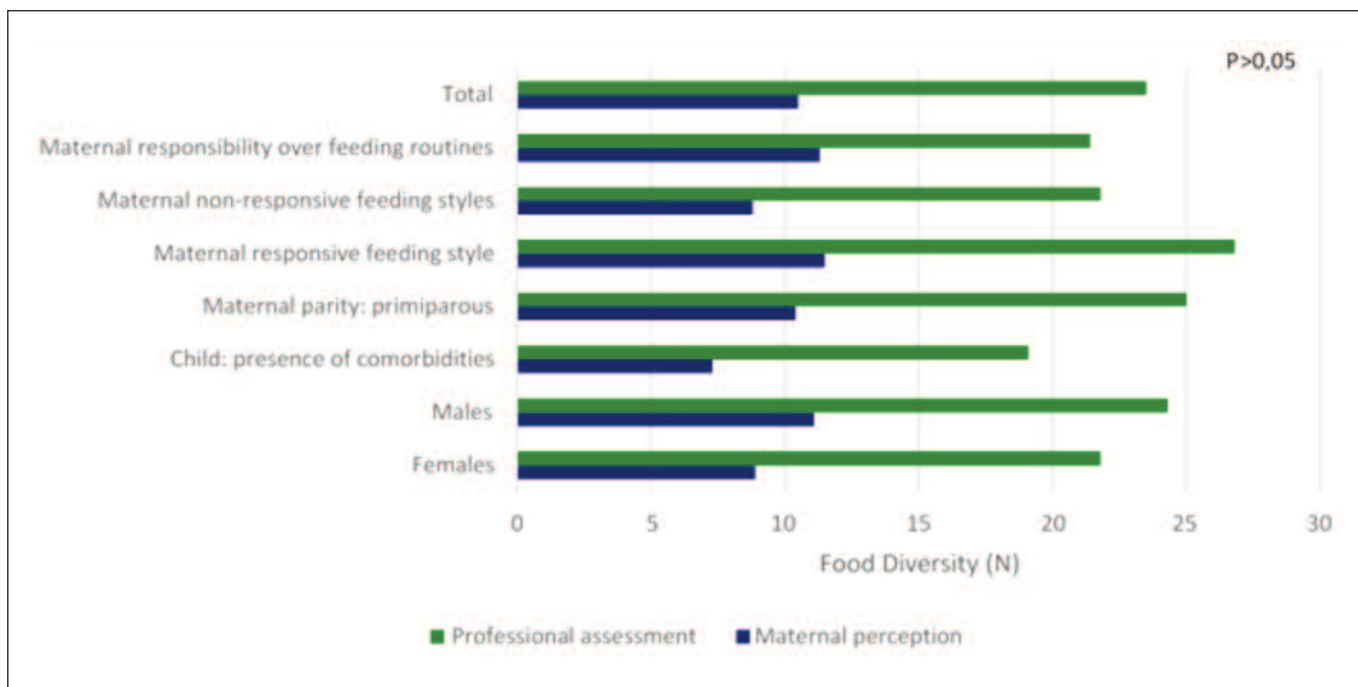
The results of this study suggest that maternal perception of children's food repertoire and the nutritional evaluation have low reproducibility and – hence – isolated maternal reports may not be an ideal predictor of children's feeding situation when it comes to the variety of foods accepted and selectivity patterns. Therefore, it is important for health professionals managing feeding difficulties to deepen the investigation on eating patterns.

In this context, the food inventory developed by CDA allows organization and discrimination of the information about the food acceptance and rejection, besides allowing a clear analysis of the sensorial characteristics of the foods already accepted before and now avoided (colors, smells, consistencies, textures and flavors constituting the patient's food preference). The use of this supplementary instrument facilitates faster identification of refusal patterns; information which are not methodologically organized on FFQs, DRs or 24HRs. Aware of these data, the professional can more easily reflect on the possible relations between dietary patterns and the

**Figure 2.** Comparison between food diversity assessed by professionals and reported by mothers. Instituto PENSI; 2017.

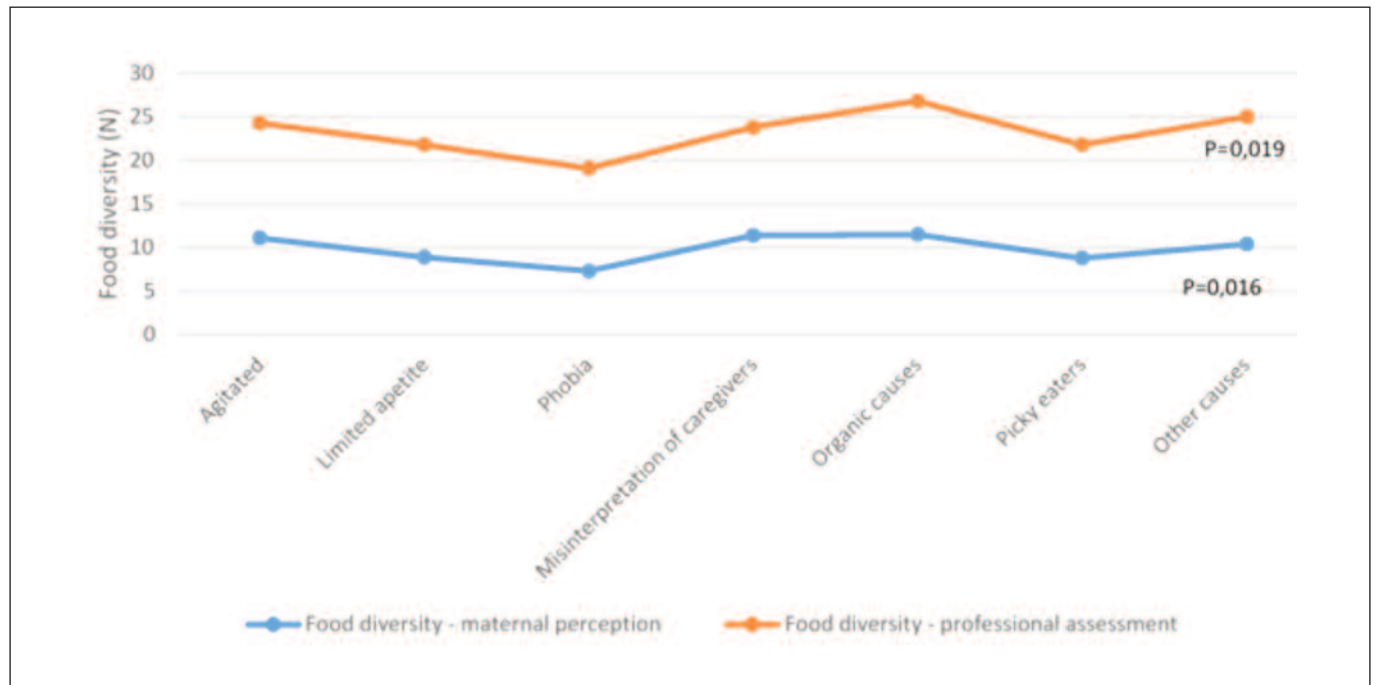


**Figure 3.** Food diversity according to population characteristics. Instituto PENSI; 2017.



general markers of development (such as dentition, postural control, etc.). Despite the clinical use of high practicality and importance, the food inventory is not a validated dietary assessment method for epidemiological use with the pediatric population and probably for this reason studies are carried

out with its use. In fact, there is currently no validated questionnaire to assess food variety *per se* in children with FD, and it is not surprising that data on food variety vary considerably between studies<sup>2,4,8,9</sup>. Therefore, the use of the previously mentioned validated instruments to evaluate general feeding

**Figure 4.** Food diversity (N) according to FD diagnosis and professional/maternal perception. Instituto PENSI, 2017.

patterns of children remain indispensable as to the qualitative/quantitative characterization of child's food intake.

Overall, mothers reported 2.2 times less diversity of foods on their children's diet than the professional assessment by a nutritionist did, and this underestimated perception can be related to a greater maternal concern over the food intake inadequacy when there is a FD perceived. Clinical experience from CDA also shows a clear tendency of mothers to report in the inventory - in the category "foods that the child accepts" - only the items of child's preferential and common consumption, instead of all the accepted food items (including those less frequently consumed). This can result from the comfort generated for the mother by foods that the child consumes repeatedly and possibly in larger amounts. Therefore, the image that "the child doesn't eat anything / almost nothing" tends to perpetuate itself in the family environment and in maternal perception, maintaining the cycle of underreporting. This behavior becomes evident when the nutritionist confronts the information obtained during the dietary evaluation with the information filled in the inventory. One of the first steps to disrupt this cycle is to thoroughly inform the caregivers with objective data of the nutritional status and food intake of the child, in order to reassure them about the feeding complaint (since in most cases the child does not show signs of malnutrition, but feeding skills difficulties and behavioral problems)<sup>16,18,19</sup>) and to reduce the pressure around feeding routines. Rescuing the relationship of the caregiver with his/her own feeding worries, prejudices and taboos is also a strategy used to deal with such situations and facilitate a more accurate report.

This maternal underreport is considered normal and it is even expected, since preschool children - in a higher percentage in this sample - make their habits out of their favorite foods<sup>1</sup>. However, it may be a bias in the assessment and follow-up of FD, once inadequate perception leads to the omission of relevant information about consumption patterns. This reinforces the need (while treating children with FD) on supplementing any dietary assessment method with other survey instruments, such as the one developed at CDA. Other relevant data still can be added to the presented inventory, such as a list of foods never tried before, aiming at deepening the evaluation of eating patterns and phobic behaviors. It is important though that the instrument remains self-fillable, since it provides essential information on maternal perception of the complaint. Besides, the inventory also works as an educational tool alongside treatment phases of the FD, since it can help raise awareness of proper perceptions of food intake, and promote reduction of stress levels related to actual food consumption.

Caregiver feeding styles also influence the child's eating behavior, being the responsive style the preferred one; while authoritarian, indulgent and neglectful styles (the nonresponsive ones) generally have negative consequences on feeding processes<sup>3</sup>. When parents allow excessive food choices, or at the other extreme, when they do not allow children to have a choice, children may develop a negative relation with food, limiting their diet even more<sup>7</sup>. Such practices are more apparent when there is food refusal, although they do not lead children to eat more. Nonresponsive styles are also linked to lack of verbal contact, low affective contact, low frequency of



educational behaviors, presence of threats, distractions and use of coercion<sup>20</sup>. This style seemed to be related to the lowest diversity reports in the present study. Overall, children's resistant actions are an effect of the parent's behavior: if parents pressure the child to eat, he or she will act so as to evade or stop this pressure, usually by refusing to eat or picking out foods<sup>21</sup>.

As to the relationship found between phobic types of FD and higher level of food selectivity (reported both by mothers and nutritionists), data presented herein corroborates literature premises that food phobia in general occurs in children who suffered some kind of trauma related to the digestive system (such as invasive procedures, intubation, probing, accidents such as choking, suffocation or other situations that have caused great discomfort)<sup>3</sup>. Fear sensations caused by trauma in relation to food would therefore justify an overreaction to food. Phobic cases differ from other types of FD, which end up selecting food according to colors, textures, consistencies or even food preferences, and this data reinforces the importance of differing the type of FD during the treatment so assertive approaches are planned for each type of complaint.

There are some limitations to this study, such as the use of a clinical instrument for research purposes. To the group's knowledge, this is the first study that describes analysis of the repertoire of foods consumed by children with FD, and it is also the first one to use a food inventory as a research method of choice in association with other validated instruments. Therefore, it was not possible to find similar methodology data for comparison. Despite these limitations, the findings from this study enhance the importance of considering the influence of parental variables on children's eating patterns, besides discussing in detail about new clinical approaches in the evaluation of the dietary pattern of children with FD. The present results highlight the need for parental behavioral interventions such as individual or group counseling with psychologist or family therapist alongside with the nutritional therapy, and reinforce the importance of evaluating qualitatively and quantitatively the food intake so that parents are aware of the true paradigm of the child.

## CONCLUSION

There was maternal underestimation on the quantity of foods accepted by children with FD, that is, mothers find that their children have greater difficulties and selectivity problems than they may actually have. The data reinforce the need for the use of dietary research methodologies which are complementary to already validated strategies, as well as family orientation about the expectations regarding the feeding practices and preferences of their children.

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