

HabEat

Determining factors and critical periods in food habit formation and breaking in early childhood: a multidisciplinary approach

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Review article. The summary of existing and gap of tools to assess food habits/preferences development in humans will be presented in a review article.

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I. Objectives

The concept of child's eating behavior is complex to define and evolve throughout infancy and early childhood. In newborns, food intake is mainly determined by internal cues, such as hunger and satiation. Gradually, external cues tend to take a greater part in food intake. Another dimension of child's eating behavior, food neophobia, defined as the rejection of novel or unknown foods, appears to be low at weaning and reach a pick between 2 and 6y. Thus, to characterize child's eating behavior, several dimensions have to be assessed such as intensity of feeding problems, food avoidance (e.g. fussiness, choosiness, selectivity, pickiness, neophobia, satiety responsiveness, slowness in eating, emotional undereating and, for older children, dietary restraint), food approach (e.g. enjoyment of food, food responsiveness, appetite, emotional overeating). Food habits, characterized by a behavioural pattern or routine repeated on a regular basis, and food preferences seem to be partly formed at 2-3 years.

The family provides a major context for early eating experience. Parental feeding practices develop to coincide with child maturity and to adapt to child's behavior but can also affect the development of child's food intake or preferences. Parental feeding practices could be categorized in several dimensions: authoritarian feeding practices (such as pressure to eat or restriction of child's eating), authoritative feeding practices (such as control of food availability, teaching nutrition or parental modeling), permissive feeding practices (child's control on eating), use of food for non-nutritive purpose, parental state during feeding and parental concern about child's weight or child's eating.

The objective of task 1.2 is to identify existing and gaps in tools used in literature to assess parental feeding practices, food habits in young children, and their determinants such as appetite, satiety and food preferences.

A Review of Methods to Assess Parental Feeding Practices and Preschool Children's Eating Behavior: The Need for Further Development of Tools.

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ABSTRACT

We reviewed tools developed to measure parental feeding practices and eating behaviour and food intake or preferences of children aged 0 to 5 years. Two electronic literature databases (Medline and Psycinfo) were used to search for both observational and experimental studies in human beings. The articles selected for review were those presenting tools with data on internal consistency and/or test–retest reliability and/or construct validity. A total of 3,445 articles were retrieved, and further searching of reference lists and contact with experts produced an additional 18 articles. We identified three tools on the qualitative dimension of children's eating behavior, two tools on food intake or preferences, and one tool on parental feeding practices with rigorous testing of internal consistency, construct validity, and test–retest reliability. All other tools presented in this review need further evaluation of their validity or reliability. Because major gaps exist, we highlight the need for more tools on parental attention to children's hunger and satiety cues, and the need to evaluate the degree of control allowed to children younger than age 2 years in feeding events. Food avoidance (ie, behaviors or strategies to take away and to reject food) and food approach (ie, attractiveness for food stimuli) have not been assessed in children aged 12 to 24 months. Food preference tests based on sensory aspects rather than nutritional quality may be worth investigating. We identified a need for further evaluation of quality, especially test–retest reliability and construct validity, for most tools developed for use in studying children aged 0 to 5 years.

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II. Deliverable procedure

Literature Search Methods

Search strategy

Two electronic literature databases (Medline, Psycinfo) were used to search for documents in any language from the year of database inception until March 17, 2010. The search syntax included two key elements:

- terms for methodology (questionnaire, test, tool, experiment, assessment, measure, instrument, scale)
- terms for eating behaviour (eating behaviour, appetite, satiation, satiety, neophobia, fussiness, fussy eating, choosiness, picky, pickiness, selective eating, selectivity) or for parental feeding practices (feeding behaviour, feeding practices) or for food habits and preferences (food preferences, food diversity, food variety, food habits, meal frequency, food intake).

The filter for studies in humans and among all infants or preschool children was activated.

In a second step, reference lists of retrieved documents were searched for additional documents of interest.

Finally, an additional paper (Llewellyn, van Jaarsveld et al. 2010) was also included in the review, even though it was published on March 26, 2010 because it filled an important gap in the assessment of child's eating behaviour.

Inclusion/Exclusion criteria

Documents identified by the search were divided between eight reviewers for further evaluation, first using the titles, then using the abstract and finally using the full text. In this step, the homogeneity of the selection process was tested on a subsample of 30 documents and any disagreement was resolved by discussion and re-examination of the document during a workshop.

The papers selected for the review were those presenting tools for infants and young children (0-5y) with reliability data, i.e. data on internal consistency and/or data on test-retest reliability and/or data on external validity (correlation with another measurement of the same

construct). Studies merely using a tool without providing new validity or reliability data were not included in the review.

We excluded from the review

- Papers that purely focused on breastfeeding (i.e. the promotion of breastfeeding, issues with breastfeeding).
- Papers in preterm infants before hospital discharge, in infants or mothers with HIV/AIDS, in infants with malnutrition or specific illness, given that potential determinants of infant feeding and behaviour might differ in these context.
- Papers describing tools based on videotaping of meals, given that their use might be difficult in large-scale studies.
- Papers on the assessment of feeding practices by breastfeeding duration or age of introduction of specific food groups
- Papers on diversity or quality scores which were not considered as specific tools.
- Papers on assessment of children's taste preferences rather than food preferences.

Native speakers examined papers written in languages other than English. Four papers in Japanese, 1 in Chinese, 1 in Italian and 1 in German were not considered due to the lack of skills in these languages among partners.

Data extraction

For each of the considered tools, data extracted for the review included:

- country of origin, existing translations;
- sample characteristics;
- mode of administration of the tool;
- list of items and scales, scoring method;
- internal consistency;
- test-retest reliability;
- external validity data.

Data were extracted separately in three fields: child's eating behaviour, parental feeding practices and child's food intake/preferences.

Results

A total of 3,445 documents were retrieved from the electronic database search, of which 169 met the inclusion criteria. Further searching of reference lists, personal archives and contact with experts produced an additional set of 17 papers included in the review.

Ninety-three papers described tools or data on their reliability or validity, some of them described more than one tool: 31 papers described tools on child's eating behaviour, 40 on parental feeding practices and 30 assessing child's food habits and preferences.

Parental feeding practices

Nineteen questionnaires were developed, and their reliability tested, to assess parental feeding practices from birth to 5y (Table 1). Eight dimensions of feeding practices have been assessed by these questionnaires. If several questionnaires were developed to assess authoritarian practices such as pressure to eat or restriction of child's eating, the other aspects of parental practices were less examined, especially in infants and toddlers. Test-retest reliability was assessed only in five tools and external validity only in two tools.

Table 1. Number of tools available to assess parental feeding practices by 8 different domains and highlighting of identified gaps.

<u>Dimensions of parental feeding practices</u>	Age set (in months)						Total
	<12	12-24	24-36	36-48	48-60	>60	
Authoritarian							
Pressure	3	1	4	5	6	5	11
Restriction	1	2	4	5	5	5	8
Monitoring	1	1	2	2	2	3	5
Encouragement through reward			2	3	3	2	3

<u>Dimensions of parental feeding practices</u>	Age set (in months)						Total
	<12	12-24	24-36	36-48	48-60	>60	
Parental control			1	2	2	1	2
Feeding on schedule		1					1
Authoritative							
Food availability			1	2	3	3	4
Teaching nutrition			1	2	2	1	2
Verbal praise / Encouragement			2	3	3	3	4
Modeling			2	2	2	3	3
Child's involvement			1	1	1	1	1
Permissive							
Permissiveness	1	1	1	1	1	1	2
Child's control			3	3	3	3	4
Use of food							
Emotion regulation	1	2	2	2	2	2	5
Food as reward			1	1	1	2	2
Parental state during feeding			1	2	2	2	2
Parental concern							
Responsibility		1	1	1	1		1
Concern about weight		2	2	2	2		3
Concern about eating		1					1
Awareness of infant's cues	1	2					2
Interaction							
		1	1	1	1	1	3
Other practices							
						1	1











Blue filling: gap in tools

Orange filling: non applicable

Child's eating behavior

Fifteen questionnaires were developed, and their reliability tested, to assess child's eating behaviour from birth to 5 years (Table 2). The main gap identified appeared to be the assessment of the dimension "child's food approach" in toddlers, that includes measures of food enjoyment, overeating and appetite. Test-retest reliability was assessed in seven tools and external validity in five tools.

Table 2. Number of tools available to assess child's eating behavior and highlighting of identified gaps.

<u>Dimensions of child's eating behavior</u>	Age set (in months)						Total
	<12	12-24	24-36	36-48	48-60	>60	
Clinical measures of eating and feeding problems	1	1	2	2	3	3	4
Disturbing mealtime behavior		1	1				1
Measures of 'food avoidance'							
Fussiness/Choosiness/ Selectivity/Pickiness	1	1	2	1	1	1	3
Neophobia		1	1	1	3	4	4
Satiety responsiveness/ Slowness in eating	1			1	1	2	3
Emotional undereating				1	1	1	1
Measures of 'food approach'							
Enjoyment of food	1			1	1	1	2
Food responsiveness/ overeating	1			1	1	1	2
Appetite/Feeding intensity	2						2
Emotional overeating				1	1	1	1

<u>Dimensions of child's eating behavior</u>	Age set (in months)						Total
	<12	12-24	24-36	36-48	48-60	>60	
Desire to drink		1	1	1	1	1	1
Dietary restraint						1	1

Blue filling: gap in tools
Orange filling: non applicable

Child's food intake/preferences

Most studies, identified under this domain, described common nutritional epidemiological tools (food frequency questionnaire, 24-h recalls, food records or diet history) to assess child's food intake. We decided to present only tools specifically designed for and tested in young children (Table 3). We identified six food frequency questionnaires (FFQs) designed to assess the whole food intake, one to estimate specific intakes as healthy foods, one on fruit and vegetables intake, one on calcium intake and one on dietary fat. A web assessment of food intake was also validated in young children as well as a food record specifically designed for children. Four Food Preferences Questionnaires and four Preference Tests were developed to assess food preferences in children older than two years.

Table 3. Number of tools available to assess child's food intake/preferences and highlighting of identified gaps.

	Age set (in months)						Total
	<12	12-24	24-36	36-48	48-60	>60	
Food intake							
Food frequency questionnaire (whole diet)	1	2	2	2	1	3	6
Food record		1	1	1	1		1
Web assessment				1			1
Healthy vs unhealthy foods					1	1	1

Age set (in months)

	<12	12-24	24-36	36-48	48-60	>60	Total
Fruit and Vegetables			1	1	1		1
Calcium			1	1	1	1	1
Dietary fat			1	1	1		1
Child's food preferences							
Questionnaires				1	3	2	4
Tests			1	3	4	3	4

Blue filling: gap in tools

Orange filling: non applicable

III. Identification of gaps and conclusion

For obesity prevention, the ability to respect physiological cues (hunger and satiation) during feeding events has to be considered. Most infants and young children are able to regulate food intake by these internal cues, but this ability decreases with age. Many tools have been already developed and validated to assess parental feeding practices from birth to five years. Most of them assessed authoritarian practices, such as pressure to eat or restriction of eating, known to be later related to child's eating in the absence of hunger. However, few of the tools focused specifically on parental attention to child's hunger and satiety cues throughout infancy and early childhood. Moreover, the degree of control let to children in feeding events was not assessed among children younger than two years. Thus, we consider developing tools to assess these dimensions of feeding practices in infants and very young children and the assessment of infant's or young child's sensitivity to internal cues. Different tools could be developed: 1) a tool completed by parents for very young children; 2) a tool designed for older children and completed by children themselves.

In the field of child's eating behaviour, table 2 highlighted that measures of food avoidance and measures of food approach were not assessed in children aged 12-24 months. So, the development of a questionnaire to assess these dimensions of child's eating behaviour in toddlers is also under consideration.

In the child's food intake/preferences field, few tools were validated in children. Several food frequency questionnaires were designed and validated in young children, some of them focused on specific aspects of food intake such as fruit and vegetable intake or calcium intake. Tools designed to assess food preferences were developed mainly in preschoolers and they focused on preferences for healthy vs. unhealthy foods. It could be interesting to develop preferences questionnaire or test based on the sensorial quality of foods rather than

their nutritional quality. Due to cultural differences in diet across countries, developing questionnaires or tests on food intake and preferences that could be used across several countries remains a challenge.