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The PEACH survey: A nutrition screening tool for use in early intervention programs

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Young children who have or are at risk for developmental problems are particularly vulnerable to nutrition-related conditions including underweight, feeding and oral-motor problems, and dietary inadequacies (1). Providing appropriate care to this population requires a multistep process including broad-based screening, identification of those needing nutrition services, and referral to a dietitian for evaluation and treatment (2,3).

In North Carolina, most early intervention screenings and evaluations are conducted by multidisciplinary teams that often do not include a dietitian. Referral of all at-risk children for nutrition assessment would be unfeasible because of cost factors and limited numbers of community-based dietitians. Nutrition screening instruments could be used in these early intervention programs to identify children in need of referral, however, most existing instruments require specialized skills to administer. For the most effective use of resources, a method was needed by which nonnutritionists could identify and refer children likely to have nutrition-related problems while screening out the low-risk children.

The PEACH (Parent Eating and Nutrition Assessment for Children with Special Health Needs) survey is designed to be self-administered by a child's primary caregiver. A self-report format has been

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used in other screening instruments, such as the Child Behavior Checklist (4), and as part of the Nutrition Screening Initiative (5). The hypothesis was that when presented with the right questions in nontechnical language, parents could provide adequate information to determine whether a child needs a nutrition evaluation. In this article, we report on a validation study that compares children's PEACH survey scores with dietitians' assessment results.

METHODS

Sample

The study sample consisted of 79 children younger than 6 years and their primary caregivers (eg, parent, grandparent, or foster parent). Families were recruited from August through December of 1992, from three North Carolina developmental screening and evaluation program sites. The project was approved by the Human Subjects Review Committee of the University of North Carolina School of Medicine, Chapel Hill.

Survey Development

Pediatric nutrition screening instruments were reviewed (6-9) and questions were selected that pertained to the target age group. Questions were adapted for individuals with low literacy skills; standard literacy measures indicated that the survey was at approximately a fifth-grade reading level (10). A "yes" or "no" response format was used for all items (see Figure 1). Pretesting was conducted to ensure that the target population could understand the items.

A panel of six developmental pediatric experts determined content and face validity of the items. A scoring system was developed by having panel members assign each item a value on an ascending four-point scale based on the relative nu-

PEACH * Survey

Agency: _____ Date: _____

Child's Name: _____ Date of Birth: _____

Address: _____ Phone #: _____

Please circle YES or NO for each question as it applies to your child.

Does your child have a health problem (do not include colds or flu)? If yes, what is it?	YES NO	1
Is your child: Small for age? ___ Too thin? ___ Too heavy? ___ (If you check any of the above, please circle YES)	YES NO	3
Does your child have feeding problems? If yes, what are they?	YES NO	3
Is your child's appetite a problem? If yes, describe:	YES NO	1
Is your child on a special diet? If yes, what type of diet?	YES NO	2
Does your child take medicine for a health problem (Do not include vitamins, iron, or fluoride)? Name of medicine(s):	YES NO	1
Does your child have food allergies? If yes, to what foods?	YES NO	1
Does your child use a feeding tube or other special feeding method? If yes, explain:	YES NO	4
Circle YES if your child does not eat any of these foods: Milk ___ Meats ___ Vegetables ___ Fruits ___ (Check all that apply)	YES NO	1
Circle YES if your child has problems with : Sucking ___ Swallowing ___ Chewing ___ Gagging ___ (Check all that apply)	YES NO	3
Circle YES if your child has problems with : Loose stools ___ Hard stools ___ Throwing Up ___ Spitting Up ___ (Check all that apply)	YES NO	3
Does your child eat clay, paint chips, dirt, or any other things that are not food? If yes, what?	YES NO	2
Does your child refuse to eat, throw food, or do other things that upset you at mealtime? If yes, explain:	YES NO	2
For infants under 12 months who are bottle fed : Does your child drink less than 3 (8-ounce) bottles of milk per day:	YES NO	1
For children over 12 months : (Check if applies and circle the YES) Is your child not using a cup? _____ Is your child not finger feeding? _____	YES NO	1
For children over 18 months : Does your child still take most liquids from a bottle?	YES NO	2
Circle YES if your child is not using a spoon?	YES NO	2

* Parent Eating and Nutrition Assessment for Children with Special Health Needs
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Total =

The Parent Eating and Nutrition Assessment for Children with Special Health Needs (PEACH) survey.

tritional importance of a positive (yes) response. The total PEACH score was calculated by summing the scores for all positive responses. The panel established a cutpoint of four or greater to indicate a probable nutrition problem.

Nutrition assessment by a pediatric dietitian was chosen as the standard to compare with the PEACH score. A standard protocol was followed that included chart review, anthropometric measures, health and medication history, dietary intake (using 24-hour recall and brief diet history methods), feeding and oral-motor function, and behavioral or environmental problems affecting nutrition. We reviewed biochemical information, if available, but we did not obtain any as part of this study.

Data Collection

Staff members at each site distributed and collected all PEACH surveys. After providing informed consent, parents completed the survey in the waiting room using paper and pencil. The dietitian's assessment was performed on the same day, but without knowledge of the child's PEACH score. After each assessment, the dietitian completed an evaluation form summarizing any nutrition-related problems. To reduce possible interrater bias, both dietitians (MC and KK) who performed the assessments reviewed each case and any questions were referred to a third dietitian for a deciding opinion.

RESULTS

The study children were predominantly male (52 boys and 27 girls). Forty-two children were black, 35 were white, and 2 were of other ethnicity. Mean age was 3.3 years (range=0.25 to 5.9 years) and mean parental education was 12.5 years (20 had not completed high school). The prevalence rate of nutrition problems in these children was 44. The PEACH scores and the dietitians' assessment results yielded the same prevalence rate.

Sensitivity and specificity of the instrument were calculated by comparing the PEACH survey results with the dietitians' assessments (11). Sensitivity was 88.6% and specificity was 90.9%. Overall predictive value of the instrument was 88.6%.

Table 1 shows the percentage of children in each nutrition-related diagnosis category who screened positive for nutrition problems on the PEACH survey. Feeding problem was the most frequently occurring nutrition-related diagnosis, followed by underweight. Nine children had dietary imbalances, seven had nutrition problems related to behavior or environment, and four were overweight. Four children with nutrition problems scored less than four on the PEACH survey. Two of

Table
Number of nutrition-related problems identified by dietitians' assessments^a

Nutrition problem	Number of nutrition problems identified by a dietitian's assessment	Number of problems identified by PEACH ^b survey score of 4 or above
Feeding problem	18	16
Underweight	12	12
Dietary imbalance	9	9
Behavior/environment	7	7
Overweight	4	2

^aA dietitian identified nutrition-related problems in 35 children. Of these children, 23 had one, nine had two, and three had three nutrition-related problems.

^bPEACH = Parent Eating and Nutrition Assessment for Children with Special Health Needs.

these children had feeding problems and two were overweight. Other research indicates that parents tend to underestimate the weights of preschool children objectively classified as overweight (12).

APPLICATIONS

Our findings indicate that the PEACH survey has good sensitivity and specificity for use in nutrition screening of children from birth to 5 years of age who have or are at risk for developmental problems. Implementation of nutrition screening must also include establishment of a referral system to community dietitians who can assess nutrition-related problems and design appropriate interventions. The PEACH survey provides a quick method of screening out unnecessary referrals to maximize effective use of dietitians' time. Limitations of the instrument, however, should be emphasized. A child with a low PEACH score who professionals or parents feel may have a nutrition problem should be referred to a dietitian. It is also strongly recommended that anthropometric measures and, when possible, biochemical indexes be obtained as a routine part of developmental and nutrition screening.

The PEACH survey was developed and tested in a central North Carolina population. Substantial adaptations may be needed for use in other geographic areas or populations, such as Hispanic Americans and Asian Americans. ■

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