

DOI: 10.21767/2572-5394.100028

Use of the Child and Diet Evaluation Tool (CADET) With Mothers of Preschool-aged Children

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Received date: March 28, 2017, **Accepted date:** April 20, 2017, **Published date:** April 24, 2017

Citation: Boucher N (2017) Use of the Child and Diet Evaluation Tool (CADET) With Mothers of Preschool-aged Children. *J Child Obes* 2: 7.

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Abstract

Objective: Obtaining a diet history on children is difficult and often inaccurate. This study utilized the Child and Diet Evaluation tool to conduct a 24-diet history on preschool-aged children.

Methods: One-hundred and twenty-six mother/child dyads participated in the study. Each mother completed a demographic data sheet and the Child and Diet Evaluation tool.

Results: The CADET provided a great deal of descriptive data as to what food choices mothers offered their preschool-aged child during a 24-hour period. None of the mothers in the study offered their child the recommended numbers of servings from each food group during the 24 hour-period.

Conclusion: The Child and Diet Evaluation Tool provided a great deal of descriptive data about the food mothers offered their children during a 24-hour period. Mothers found the tool easy to use. The tool lacks the ability to determine the portion sizes.

Keywords: Obesity; Childhood; Food diary; Child and diet evaluation tool; Demography

Introduction

Childhood obesity is reaching epidemic proportions worldwide and early onset obesity is of utmost concern, indeed. Research has shown that (i) individuals who become overweight or obese before the age of five (vs. later in life) tend to (a) be more severely affected and (b) become overweight (or obese) adults and (ii) one of the major contributing factors to early onset obesity (in childhood) is the type of food offered to children on a daily basis [1-6]. However, obtaining a dietary history of a child is difficult and often inaccurate [7-9]; one of the most significant, associated concerns is accuracy of recall [10-12] since the ability of a child to recall dietary intake is dependent on developmental and cognitive developments [11,13].

Furthermore, there is (i) limited research on childhood dietary assessment, (ii) under- and over-reporting on many of the tools utilized in the research [6,14] and (iii) many of the tools created to evaluate a child's diet are not easily utilized by the lay public. However, Cade and colleagues created the Child and Diet Evaluation Tool (CADET) [15], which was designed to be utilized by parents in the United Kingdom for purposes similar to this research; however, it has not been frequently utilized in the United States [15].

Review of the CADET

The CADET was designed to (i) measure all food and drink offered to a child in a 24-hour period, (ii) record all food and drink consumed over the associated timeframe, (iii) be utilized by the lay public, and (iv) was tested in the United Kingdom. Cade and colleagues compared the CADET to a 24-hour semi-weighted food diary that was completed on the same day as the checklist; both the 24-hour diary and CADET covered the same 24-hour period. Indeed, the CADET (vs. other tools) correlated better with the 24-hour diary. The correlations for the food checklist and 24-hour diary ranged from $r=0.41$ to 0.89 .

Other tools usually correlate at a range of $r=0.30$ to 0.40 . The CADET was tested for repeatability with a subgroup of 30 parents; on two separate days, checklist and food diaries were utilized to test the CADET (for repeatability). "The second CADET gave values slightly closer to the 24-hour diary"³ (Cade et al., 2005, pg.14). While the two CADETs did not correlate well with each other (as expected), the instrument did correlate well with the 24-hour food diary (recorded on the same day) [15].

The CADET was utilized in a study (i) that evaluated the relationship between maternal beliefs and behaviors and the body weight status of preschool-aged children and (ii) to obtain descriptive data (a) about the food that was served to preschool-aged children and (b) to determine if the mothers offered the children the U.S. Department of Agriculture's (USDA's) recommended allowance for each food group. The Wayne State University Institutional Review Board approved the study and a letter of support was obtained from the Head Start agency that recruited the participants.

Methods

Study participants were recruited from a southeastern Michigan Head Start program. They were invited to an informational meeting and recruited via direct person-to-person contact. A total of 126 mother/child dyads participated in the study and included 43% (n=55) male children and 56% (n=71) female children. All of the mothers lived at (or below) the poverty level and were enrolled in the Supplemental Nutrition Program for Women, Infants, and Children (WIC). All the participants could read and speak English.

CADET

The CADET is divided into sections A to R, with A to Q utilized for checking off the foods and drinks served to a child during a 24-hour period. Each of the food sections is divided into eight columns. (1) The first column lists food categories; there are several food and drink options listed therein. (2) The remaining seven columns are utilized when children are offered specific foods. (3) There are also columns for breakfast, lunch, dinner, and four snacks. (4) The columns enable the mothers to check off how many times their children were offered particular foods and drinks each day. At the end of the CADET, there are several questions that assess the types of foods and beverages offered to each child on a daily basis.

The CADET was modified for the current study; however, while additions were made to the CADET, nothing was removed from the tool. Additions to the CADET included foods that are commonplace within United States and common to preschool-aged children (e.g., fish sticks, oatmeal, and grits). Mothers were encouraged to write in specific types of foods when they could not find them listed within the tool. In the last section, questions assess each child's average daily intake of juice and milk. CADET response choices comply with the Imperial system; however, they were modified to the "USA system" for the purposes herein. Additionally, fat content and types of breads were modified to reflect U.S. standards. Milk choices read "skim milk," "1% milk," "2% milk," "whole milk," and "lactose-free milk." Bread choices read "other," "whole-grain bread," "whole-wheat bread," "white with added fiber," and "white bread."

Demographic Data Sheet

Demographic data were collected on an investigator-created, demographic data sheet. The demographic data sheet collected data about the mother/child dyad, the household, and the community.

Questions focused on the (i) height and weight of the mother during pregnancy, (ii) number of people residing in the household, (iii) distance that the family lived from the associated WIC office, (iv) location of the grocery store utilized by the family, and (v) confirmed the presence (or absence) of the father in the household. Each mother completed the demographic data sheet and additional questionnaires at home.

Data Analysis

Data were analyzed using the most current version of Statistical Packages for the Social Sciences (SPSS). To determine the needed sample size G*Power 3 was utilized for the power analysis. Power analysis determined the needed sample size using G*Power 3. Power was computed for the multiple regression analysis with power set at 0.8, an alpha of 0.05, and a medium effect size. A total of 126 research packages were included in the analysis. For the current study, the Cronbach's alpha for the CADET was 0.67.

Results

While the mothers (in the study) were 20 to 45 years of age, they were, on average, 31 years of age (M=30.91, SD=6.57). Over half of the mothers had high school diplomas (or an equivalent level of education); also, 22% of the mothers were white (22%, n=28), 65% were black (65%, n=82), and 7% (5%) were legal guardians. The children in the study were 37 to 71 months of age (M=52.14, SD=7.59) and (i) 65% (n=82) were black, (ii) 13% (n=16) were white, (iii) 6% (n=8) were Hispanic, and (iv) 16% (n=20) were classified as other. All of the participants lived at below the poverty level.

Demographic Data Sheet

Participants reported that the total number of people living in the household, outside of the mother/child dyad, ranged from two to nine (M=4.26, SD=1.62); also, 16% (n=20) of the mother/child dyads dwelled with grandparents. In 71% (n=89) of the households, the father did not reside in the household; however, in 24% (n=30) of the households, the mother's significant other did reside in the household (i.e., with the mother/child dyad). When the children did not reside with their fathers, they generally spent between zero and seven days a week with them; however, almost half of the children (43%) had no contact with their fathers. Only 14% of child participants (n=13) spent time with their fathers on a daily basis. Additionally, 73% (n=92) of the households contained additional children. The majority of the participants (87%) owned a car and they all lived between one and 15-plus miles from the grocery store and WIC office. Indeed, 91% of the mothers were responsible for grocery shopping (n=114) and 98% (n=124) reported shopping at grocery stores with fresh fruits and vegetables. Additionally, 93% of mothers prepared all of the household meals (93%, n=117).

The body mass index (BMI) of mothers at the time of pregnancy varied greatly; the figures ranged from 14 to 58, with an average of 27 (M=27.3, SD=7.4). The breakdown of the weight classifications at the time of pregnancy was as follows: 3% were underweight (n=4), 43% were normal weight (n=54), 25% were overweight (n=31), and 27% were obese (n=34). Additionally, 68% (n=85) of participants had never smoked, there was no exposure to smoke in 64% (n=81) of the households, and 37% of the mothers reported smoking between one and 20 cigarettes per day. Breast-feeding, in this study, was defined as having breast fed a child for one month (or greater); 29% (n=37) of the mothers reported breast-feeding for greater

than one month and 37% (n=47) reported breast-feeding initially.

The CADET

The CADET provided a great deal of descriptive data; however, it did not provide the food that the child actually consumed (or serving sizes). The CADET did contain data on the number of times a child was offered a specific food and the quantity of food consumed within a 24-hour period. This information enabled the researcher to quantify the number of times a child was offered a particular food (i.e., from the five food groups), within a specific 24-hour period, to determine if each mother was offering food from each food group (at the rate recommended by the USDA). A mother was given one point for each time she met the USDA recommendations for each food group. If the mother did not meet the recommendations, a score of zero was given. The total points were added and then divided by five to create a percentage. This percentage became the "food served score." The "food served score" only reflects the number of times a mother offered a child the different foods; thus, it does not reflect (i) whether the food was consumed or (ii) the serving size offered to the child.

The CADET contained a frequency questionnaire in order to record the number of times a mother offered her child a particular food during a 24-hour period. Indeed, none of the mothers followed the USDA recommendations (for all five of the food groups) when serving their children food during the study period. On average, a mother met the USDA daily recommendations approximately one-third of the time; the associated scoring, in this study, ranged from 0% to 80% (m=33.97, SD=21.05). Overall, a small percentage of the mothers in the study met the USDA daily recommendations for grains (30%), fruits (26%), vegetables (38%), dairy (32%), and protein (42%). Also, some mothers exceeded the USDA daily recommendations. Almost half of the mothers (47%, n=59) offered their child more fruit in a 24-hour period than what is recommended by the USDA and a significant percentage of mothers (30%, n=38) exceeded the USDA dietary guidelines for foods from the protein group.

At the end of the CADET, the mothers are asked several questions that focus on the types and quantities of foods consumed by their children. (1) In the current sample, 80% (n=100) of the children consumed whole-grain bread. (2) On a daily basis, fruit consumption varied greatly (i.e., one-quarter of a piece of fruit to six servings of fruit daily); however, 33% (n=42) of the children had two servings of fruit per day. When a child consumed a piece fruit, over half of the children (57%) ate the entire piece of fruit. (3) Vegetables were not consumed as frequently by the children in this study (e.g., the entire group reported the consumption of zero to four servings per day and one-third of the children in the study consumed half a serving of vegetables per day). (4) Additionally, 83% (n=104) of the mothers reported that their children consumed 2% milk. (5) Butter was the most frequently reported spread consumed by the children in this study (37%, n=28). (6) Fruit juice ranged from zero to more than one cup per day; indeed, approximately one-third (36%) of the children consumed more than one cup per

day. (7) Added sugar ranged from zero to seven teaspoons per day and 40% of the mothers reported the child did not have any added sugar per day.

Discussion

The questions, at the end of the CADET, provide a great deal of data about a child's typical daily diet. Indeed, none of the mothers in this study strictly adhered to the USDA's dietary guidelines on a typical day; instead, they tended to offer their children more fruit and protein and fewer vegetables (vs. the USDA recommendations). In sum, the CADET is a useful tool for recording the food that is offered to a child in a 24-hour period. Nevertheless, several limitations are associated with its utilization. First, it does not reflect whether or not a child consumed a specific food that was offered. Second, the CADET does not reflect the portion size of the food that was offered. Lastly, if the child was offered additional snacks (vs.) what the CADET allows the mother to record, this information is also not documented.

Mothers did report that the CADET was easy to use (e.g., they appreciated having the foods and meals already listed) and it has shown better reliability and validity than other dietary assessment tools. The CADET can also be utilized for longer periods of time. Furthermore, since all of the foods are listed for the mother, the CADET appears to be less burdensome (vs.) other methods of obtaining child dietary patterns). Thus, the CADET (i) does correlate better to a 24-hour (diet) diary than other tools, (ii) is easy for mothers to use, (iii) provides a great deal of descriptive data, (iv) can be modified to fit the U.S. diet, and (v) is designed to be used by the lay public. However, while it worked well in this current study, it has certain limitations and therefore does require further testing to determine if it will continue to be an optimal tool for evaluating children's diets.

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