

## Research and Professional Briefs

## Characteristics of Family Mealtimes Affecting Children's Vegetable Consumption and Liking

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## ABSTRACT

Research has documented an association between family mealtimes and higher dietary quality in school-aged children and adolescents. However, there is little understanding of the specific characteristics of mealtimes that are beneficial and a lack of research with preschool-aged children. This cross-sectional study conducted in the United Kingdom in 2008 examined associations between mealtime characteristics and preschoolers' vegetable consumption and liking. Four hundred and thirty-four primary caregivers of children aged 2 to 5 years reported on children's vegetable intake and liking and completed a questionnaire on frequency of family meals, food preparation, and the social and environmental context of family mealtimes. Univariate and multiple linear regression analyses assessed mealtime variables and children's vegetable intake and liking. Multiple regression analysis revealed children's vegetable consumption was predicted by eating approximately the same food as their parents ( $\beta = .14$ ;  $P \leq 0.01$ ), using ready-made sauces ( $\beta = .12$ ;  $P \leq 0.05$ ), and cooking from scratch ( $\beta = .11$ ;  $P \leq 0.05$ ), accounting for 21% of the variance (with covariates). Children's liking for vegetables was predicted by eating approximately the same food as their parents ( $\beta = .15$ ;  $P \leq 0.01$ ) and use of preprepared dishes ( $\beta = .15$ ;  $P \leq 0.01$ ), accounting for 8% of the variance (with covariates). Frequency of family mealtimes was unrelated to children's vegetable consumption or liking in this sample. This contrasts with findings in older children and adolescents, where frequency of family mealtimes is related to dietary quality and intake. In preschool-aged children, it seems emphasis should be placed on encouraging parents to provide home-cooked meals that mirror those eaten by the adults in the family to improve vegetable intake.

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Regular family mealtimes have been associated with higher dietary quality in both school-aged children (1) and adolescents (2), with associated effects observed on increased fruit and vegetable consumption (1-5), reduced soft drink intake (1,2,5), and increased breakfast frequency (3,4,6). Family mealtimes are implicated in the prevention and reduction of childhood overweight (7), although findings in this area are not entirely consistent (6,8-10). Longitudinal research indicates that family mealtime frequency during adolescence predicts better dietary quality and more regular meal patterns in early adulthood (5,11), yet many families eat together fewer than three times a week (2,4) and the frequency of family mealtimes is decreasing (12).

Less attention has been paid to family mealtimes in preschool-aged children and, in particular, the specific characteristics of mealtimes, such as frequency, structure, who is present, use of convenience foods, and television (TV) viewing. Parents exert a strong influence on the development of children's dietary patterns through structuring mealtimes, determining availability and accessibility of different foods, and modeling eating behaviors (13-15). Because children's eating habits and food preferences develop early in life and tend to track into adulthood (16,17), the impact of family mealtimes on dietary quality in the early years is an important area of research. One study with preschoolers showed intake of fruit and vegetables were positively associated with the number of nights the family ate together (18). In addition, frequency of family mealtimes has been associated with increased discussion and knowledge of nutrition-related topics (19), indicating that they enable parents to convey positive nutrition messages to their children. Eating together as a family can also give parents the opportunity to model healthy eating behaviors (7,20,21). The latter is supported by the finding that parental fruit and vegetable consumption predicts child fruit and vegetable consumption, and this relationship becomes stronger with the increasing number of family meals eaten together (22). This is important as the inclusion of vegetables in the diet can replace consumption of energy-dense foods, thereby reducing total energy and fat intake (23). Although these suggested mechanisms are highly plausible, there is a need to investigate the specific characteristics of family mealtimes that are responsible for effects on children's diets.

The aim of this study was to examine whether family mealtime frequency is associated with healthier dietary intake among 2- to 5-year-old children by assessing specific food, social, and environmental components of mealtimes influencing children's dietary intake and preferences. Children's vegetable consumption was used as a

proxy measure of dietary quality because it is an important component of a healthy diet (23,24), and vegetables are less frequently liked and consumed than other food groups (25). Children's liking for vegetables was considered as an additional outcome, and throughout this article the term *liking* is used rather than *preference*, which is frequently misused in the literature. Greater understanding of how family mealtime practices affect children's consumption and liking for vegetables could inform interventions aimed at improving child nutrition.

METHODS

Study Design and Participants

Data for this cross-sectional study were drawn from the Poppets Study, a self-report community survey conducted in London, UK. The Poppets Study aimed to identify elements of the environment associated with healthier diets in preschoolers, including the psychological and psychosocial drivers of parental feeding practices.

Sixty preschools and Children's Centers (Children's Centers in the UK are the American equivalent of Head Start programs) took part in the study between February and May 2008. Children aged between 2 and 5 years enrolled full- or part-time were considered eligible for the study. The study was publicized with posters displayed in the preschools and centers. Envelopes containing an information sheet, questionnaire, and stamped addressed envelope were given to staff to be distributed to parents. Parents were informed that by completing and returning the questionnaire they were giving consent for their information to be used. Ethical approval was granted by the University College London Research Ethics Committee. Staff were further encouraged to distribute reminder letters 4 weeks later; however, it was not possible to monitor their distribution. A cash reward was offered as an incentive to maximize participation.

Measures

**Demographic Characteristics.** Respondents reported their ethnic group in detail; however, for statistical analysis this was categorized as "white" or "other." Socioeconomic status was assessed by parental education level, which has been shown to be more strongly related to fruit and vegetable consumption than other indices of social class (26,27), with clear associations apparent even with very young children (28). Education level was categorized on a 6-point scale ranging from no qualifications to postgraduate (eg, master's, doctorate, or advanced professional degree). Respondent's age, relationship to the child, and the child's age and sex were also obtained.

**Family Mealtimes.** Because of the limited amount of published literature on measures of family environment, the research team conducted a review of previous literature about the characteristics of family mealtimes (eg, eating together, structured mealtimes, use of convenience foods, TV viewing) to develop a self-report scale (29,30). Additional items emerged in interviews conducted with mothers of 2- to 5-year-old children (n=6). The scale was specifically designed for this study and was administered to a pilot sample of 53 mothers of preschoolers to determine relevance, appropriateness of the language, and

Item no.	Question
1.	How often do you cook your child's main meal "from scratch"? <sup>abc</sup>
2.	How often does your child eat breakfast at home?
3.	How often does your child eat his/her main meal with friends or brothers and sisters?
4.	How often do the adults in your family eat three meals a day?
5.	How often do you buy takeout for your child's main meal? <sup>c</sup>
6.	How often does your child eat his or her main meal sitting at a table?
7.	How often does your child eat a lunchtime meal?
8.	How often does your child eat his or her main meal alone?
9.	How often does your child watch TV during the main meal? <sup>d</sup>
10.	How often do you use ready-made sauces for your child's main meal? <sup>c</sup>
11.	How often does your child eat approximately the same food as you for the main meal?
12.	How often do you use preprepared dishes (eg, meat/fish in breadcrumbs) for your child's main meal? <sup>c</sup>
13.	How often does your child eat a main meal with you or your partner?
14.	How often does your child eat an evening meal?
15.	How often does your family sit down together for a main meal? <sup>d</sup>

<sup>a</sup>This means using basic ingredients to cook a meal rather than using preprepared items.

<sup>b</sup>Responses on the family mealtimes scale; never/rarely; less than once a week; once a week; twice a week; three times a week; four times a week; five or more times a week.

<sup>c</sup>Adapted from Campbell K, Crawford D, Jackson M, Cashel K, Worsley A, Gibbons K, Birch LL. Family food environments of 5-6-year-old-children: Does socioeconomic status make a difference? *Asia Pac J Clin Nutr.* 2002;11(suppl 3):S553-S561.

<sup>d</sup>Adapted from Campbell KJ, Crawford DA, Ball K. Family food environment and dietary behaviors likely to promote fatness in 5-6 year-old children. *Int J Obes.* 2006;30:1272-1280.

Figure. Questionnaire assessing mealtime characteristics in British families with preschool-aged children.

response scales used for all items. This convenience sample was drawn from three day-care centers across London.

The final family mealtimes scale comprised 15 items (Figure) assessing food preparation, family mealtime frequency, and the social and environmental context of family mealtimes (29,30). Questions about use of ready-made sauces and preprepared dishes were included as a proxy measure of the use of processed foods in general (30). Parents were instructed to answer items relating to their child's main meals during a typical week. Responses were on a 7-point scale (never/rarely, less than once a week, once a week, twice a week, three times a week, four times a week, five times a week or more).

**Children's Vegetable Consumption.** Children's vegetable consumption was assessed by asking "How many servings of vegetables does your child typically eat, including those eaten at mealtimes and as snacks." Responses were on a

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