

Family Meals and Diet Quality Among Children and Adolescents in North Carolina

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ABSTRACT

Objective: To examine the relationship between diet quality and frequency of family meals throughout childhood and adolescence.

Methods: Cross-sectional study of children ages birth through 17 years (n = 1,992) using data from the 2010 North Carolina Child Health and Monitoring Program. Multiple logistic regression was used to estimate the associations between family meals and fruit intake, vegetable intake, and sugar-sweetened beverage intake among younger children, older children, and adolescents.

Results: In adjusted analyses, participating in ≥ 5 family meals/wk was associated with less sugar-sweetened beverage intake among younger (OR 2.04; CI 1.06–3.93) and older children (OR 2.12; 95% CI 1.27–3.55), greater vegetable intake among older children (OR 1.87; 95% CI 1.08–3.24) and adolescents (OR 1.81; 95% CI 1.14–2.88), and greater fruit intake among adolescents (OR 2.11; 95% CI 1.40–3.19).

Conclusions and Implications: Strategies to encourage families to establish regular family meals early in life and continue them throughout childhood and adolescence is warranted.

Key Words: family meals, children, adolescents, diet quality (*J Nutr Educ Behav.* 2014;46:418-422.)

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INTRODUCTION

Eating patterns that are developed during childhood and adolescence often continue through adulthood.¹ Food preferences are established early in life² in which children learn what, when, and how much to eat.³ Parents may use family meals as an opportunity to control the foods served at home⁴ and serve as models for eating behavior.^{3,5} By exposing their children to a variety of foods, parents can influence their child's food preferences, including the consumption of

fruits and vegetables, important measures of diet quality.^{6,7}

Recently, a number of studies were conducted to examine the relationship between family meals and measures of child or adolescent well-being, and these associations tend to vary by age group. Previous research found that when young children (approximately birth to age 6 years) typically eat what their parents eat, fruit and vegetable intake is greater, yet the frequency of eating meals together was not associated with fruit and vegetable intake.⁸ Other studies found that the

frequency of meals eaten together is associated with greater fruit and vegetable intake among older children (approximately aged 6–11 years)^{9,10} and adolescents (approximately aged 12–17 years).¹¹⁻¹⁴

Two studies conducted among older children found that frequency of family meals is associated with lower sugar-sweetened beverage (SSB) intake.^{9,10} There were also 2 studies conducted among adolescents; 1 found that increased family meals protected against high SSB intake¹³ and another found no relationship.¹² Studies examining the relationship between family meals and SSB consumption among children from birth to age 5 years were not found in the literature.

The current study examines the relationship between the frequency of family meals and measures of diet quality by age group (young children, older children, and adolescents) in the state of North Carolina among newborn to 17-year-old children. Specifically, the researchers asked the following research question: What is the association between eating the main meal of the day with the family ≥ 5 times/wk and the consumption of fruits, vegetables, and SSBs among children of different age groups?

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METHODS

This was a cross-sectional study using secondary data from the 2010 North Carolina Child Health Assessment and Monitoring Program (NC CHAMP) survey,¹⁵ which is conducted annually to meet the health surveillance needs for North Carolina male and female children aged birth to 17 years.¹⁶ Each month, eligible children's names were drawn from the North Carolina Behavioral Risk Factor Surveillance System survey.¹⁶ At the completion of the Behavioral Risk Factor Surveillance System survey, each respondent was asked whether there were any children under age 17 living in the house; if so, the respondent was asked if he or she wished to participate in the NC CHAMP callback survey. Approximately 2 weeks later, the interviewer called to speak to the person in the household who was the most knowledgeable about the health of the child (the caregiver).¹⁶ Because the age range was wide, children were categorized into 3 different age groups (6 y/group): preschool (birth to 5 years, young children), elementary school (6–11 years, older children), and middle and high school (12–17 years, adolescents).

Most questions on the telephone survey were originally developed by the National Center for Health Statistics, but they are modified by the State Center of Health Statistics each year to identify health priorities. Staff at the North Carolina State Center for Health Statistics Survey pre-tested questions over the phone among a pilot sample of 20–30 participants to ensure that they were worded clearly and logically ordered.¹⁶ The State Center for Health Statistics granted permission to use the data. Approval for this study was obtained from the University of North Carolina at Charlotte Institutional Review Board.

Family meal frequency, the independent variable in the study, was self-reported by the caregiver and was measured by the following question: "How many times in a typical week do members of your household eat a main meal together that was prepared at home?"¹⁵ Interviewers told participants that "a main meal" was defined as the meal that the family considers the most substantial meal of the day¹⁵ and that "prepared at

home" included meals made from scratch or convenience meals (eg, frozen or partially prepared foods). It was originally captured as a continuous variable. Categorization of the meal frequency was examined in a number of different ways: with a cut point of 4, a cut point of 5 (the median number of meals reported), as a categorical variable (0–3, 4–5, or 6–7 meals/wk), and as a continuous measure. Results for adolescents were relatively similar regardless of the meal frequency variable used. However, for younger and older children significant differences associated with meal frequency were detected only using the 5-meal cut point. Therefore, for the current analysis, a cut point of 5 meals was used: Specifically, those who ate 0–4 family meals/wk were placed in 1 category and those who ate ≥ 5 family meals/wk were placed into a second category.

The researchers assessed outcome variables, measures of diet quality, using 3 caregiver-reported measures. The first and second outcomes of interest were fruit consumption and vegetable consumption, defined as whether the caregiver reported that the child consumed ≥ 3 fruit servings or vegetable servings per day.¹⁷ Serving size was described by the interviewer to the respondent for each fruit and vegetable question. The last outcome was caregiver-reported SSB consumption, measured by the number of times in a typical day the caregiver reported that the child drank sweetened beverages. It was dichotomized into a binary variable: $< 1/d$ and $\geq 1/d$.¹⁸ Dietary intake cut points were determined from previous studies to compare results. Miller and colleagues¹⁷ determined that adequate fruit and vegetable servings were 3 each/d. Ranjit and colleagues¹⁹ found that ≥ 1 SSB/d was associated with decreased fruit and vegetable consumption.

The authors evaluated additional covariates to determine the effect of confounders. Characteristics of the child included age (continuous), gender (male or female), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or other),^{11,20} and the amount of television watched per day (< 2 h/d or ≥ 2 h/d).²⁰ The caregiver education level (high school graduate or less, or higher than

high school education) was also evaluated.¹¹

Frequencies and weighted percentages were generated to examine participant characteristics among the full sample. Wald chi-square test was used to test differences by age group and Bonferroni adjustment was used to account for multiple comparisons. The researchers used multiple logistic regression to determine adjusted relationships between family meal frequency and measures of diet quality, adjusting for the child's age, gender, race/ethnicity, hours of television watched per day, and caregiver's education level. Weights were applied to all analyses (SAS, version 9.2, SAS Institute Inc, Cary, NC, 2009).

RESULTS

The 2010 NC CHAMP survey had a sample size of 2,009, of which 1,992 participants answered the question regarding the frequency of family meals eaten together. About 70% of participants reported that their children participated in ≥ 5 family meals/wk; when examined by age group, about 80% of young children participated in ≥ 5 family meals/wk compared with 63% of adolescents (Table 1).

In adjusted analyses, all statistical models were adjusted for the child's age, gender, race/ethnicity, hours of television watched per day, and caregiver's education level (Table 2). For young children, there was no significant relationship between the frequency of family meals and caregiver-reported fruit and vegetable intake. However, young children who participated in family meals ≥ 5 times/wk had twice the odds of consuming no SSBs (OR 2.04, CI 1.06–3.93, $P = .033$). Among older children, those who participated in at least 5 family meals/wk had greater odds of consuming at least 3 vegetables/d (OR 1.87, CI 1.08–3.24, $P = .026$) and no SSBs per day (OR 2.12; CI 1.27–3.55, $P = .044$) compared with older children who ate with their families less frequently. Adolescents who ate at least 5 family meals/wk had greater odds of consuming ≥ 3 fruits (OR 2.11; CI 1.40–3.19, $P = .001$) and vegetables (OR 1.81; CI 1.14–2.88, $P = .012$) per day compared with those who had < 5 family meals/wk, as reported by their caregiver.

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