

# Associations among Nine Family Dinner Frequency Measures and Child Weight, Dietary, and Psychosocial Outcomes



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## ABSTRACT

**Background** Family meal frequency has been consistently and significantly associated with positive youth dietary and psychosocial outcomes, but less consistently associated with weight outcomes. Family meal frequency measurement has varied widely and it is unclear how this variation might impact relationships with youth weight, dietary, and psychosocial outcomes.

**Objective** This study assesses how five parent/caregiver-reported and four child-reported family dinner frequency measures correlate with each other and are associated with health-related outcomes.

**Design/participants** This secondary, cross-sectional analysis uses baseline, parent/caregiver (n=160) and 8- to 12-year-old child (n=160) data from the Healthy Home Offerings via the Mealtime Environment (HOME) Plus trial (collected 2011 to 2012). Data were obtained from objective measurements, dietary recall interviews, and psychosocial surveys.

**Outcome measures** Outcomes included child body mass index z scores (BMIz); fruit, vegetable, and sugar-sweetened beverage intake; dietary quality (Healthy Eating Index-2010); family connectedness; and meal conversations.

**Statistical analyses performed** Pearson correlations and general linear models were used to assess associations between family dinner frequency measures and outcomes.

**Results** All family dinner frequency measures had comparable means and were correlated within and across parent/caregiver and child reporters ( $r=0.17$  to  $0.94$ ;  $P<0.01$ ). In unadjusted analyses, 78% of family dinner frequency measures were significantly associated with BMIz and 100% were significantly associated with fruit and vegetable intake and Healthy Eating Index-2010. In adjusted models, most significant associations with dietary and psychosocial outcomes remained, but associations with child BMIz remained significant only for parent/caregiver- ( $\beta\pm$ standard error= $-.07\pm.03$ ;  $P<0.05$ ) and child-reported ( $\beta\pm$ standard error= $-.06\pm.02$ ;  $P<0.01$ ) family dinner frequency measures asking about “sitting and eating” dinner.

**Conclusions** Despite phrasing variations in family dinner frequency measures (eg, which family members were present and how meals were occurring), few differences were found in associations with dietary and psychosocial outcomes, but differences were apparent for child BMIz, which suggests that phrasing of family dinner frequency measures can influence associations found with weight outcomes.

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FAMILY MEALS ARE IMPORTANT, GIVEN THEIR ASSOCIATIONS with a variety of positive youth health outcomes. Recently, family meal literature reviews have found robust and positive associations between family meal frequency and beneficial psychosocial outcomes (eg, positive family relationships<sup>1,2</sup> and reduced risky behaviors<sup>2-5</sup>) and dietary quality outcomes (eg, higher intake of fruits, vegetables, and a variety of vitamins/minerals and lower intake of sugar-sweetened beverages [SSBs] and energy-dense, nutrient-poor foods<sup>1,3-7</sup>) for youth. However, findings have been mixed with regard to associations with youth weight status.<sup>4-6</sup>

Robust, cross-sectional positive associations with family meal frequency for youth have been found despite a lack of a gold standard measure/definition and wide variation of family meal frequency measurement, as discussed in recent reviews.<sup>1,6</sup> More specifically, the phrasing of family meal frequency questions has varied on any or all of several dimensions, including who must be present for it to be defined as a family meal (eg, from at least one parent<sup>7,8</sup> to the whole family/core household<sup>9,10</sup>) and the family eating occasion (eg, breakfast,<sup>11-13</sup> dinner,<sup>10-12,14-17</sup> or any family meal<sup>4,9,18,19</sup>). In addition, the timeframe of family meal frequency questions has varied and is most often within the past week<sup>4,15,18,19</sup> or

in a typical week,<sup>7-10,12,17</sup> but can be longer.<sup>20,21</sup> Response options have varied widely, including a full response range of all possible eating occasions,<sup>12,16</sup> to categorical,<sup>4,7-9</sup> Likert,<sup>17,22</sup> binary,<sup>11</sup> and open-ended responses.<sup>19</sup> Some questions also have added specificity about location of family meals (eg, at the table,<sup>17,23</sup> sitting together,<sup>14,22,23</sup> or at home<sup>9,13,24</sup>). The manner in which family meal frequency questions differ in phrasing regarding who must be present, response options, timeframes of reporting, which meals are considered, and/or where meals are located, can create substantial variation in the total number of possible family eating occasions. This variation potentially alters responses rates, prevalence of eating together, assessment of associations with outcomes of interest, and increases the complexity in comparing across studies, systematic reviews, and meta-analyses.<sup>1,2,5,6</sup>

Therefore, the present study explored family meal frequency measurement variation using baseline data from parents/caregivers (n=160) and their 8- to 12-year-old children (n=160) to: (1) assess correlations among nine parent- and child-reported family dinner frequency measures (ie, seven individual items measuring dinner frequency in the past 7 days, that varied by who was present and whether they were sitting and/or eating together, and two summative scales); and (2) evaluate cross-sectional associations between each of the nine family dinner frequency measures and outcomes previously examined with family meal frequency in the research literature (ie, child age- and sex-adjusted body mass index (BMI; calculated as kg/m<sup>2</sup>), dietary intake of fruits and vegetables (F/V) and SSBs, dietary quality, family connectedness, and meal conversations).

## METHODS

### Participants

The present cross-sectional, secondary analysis used baseline data (2011 and 2012) from the Healthy Home Offerings via the Mealtime Environment (HOME) Plus study.<sup>25</sup> The community-based, HOME Plus randomized controlled trial aimed to decrease excess child weight gain through family intervention activities. Detailed in full elsewhere,<sup>25</sup> trained staff recruited families from the Minneapolis/St Paul, MN, metropolitan area from community centers using various techniques (eg, flyers, presentations); recruitment criteria included English fluency, parent participants to be the primary meal preparer (99% were parents with 1% caregivers; therefore, parents is used to refer to the adult caregivers of child participants), and child participants to be 8 to 12 years old and at/or above the 50th BMI percentile. If more than one child in a family was eligible, the parent selected the child who participated in data collection. Families were randomized into a control group (newsletters) or the HOME Plus intervention group (10 monthly, interactive, family sessions aiming to increase family meal frequency and the healthfulness of meals, snacks and home food environment and reduce sedentary behavior).<sup>25,26</sup> The University of Minnesota Institutional Review Board approved trial protocols; parent and child participants provided written informed consent and assent, respectively.

### Measures

Trained study staff collected data from the primary meal-preparing parent (n=160) and child participants (n=160)

who completed psychosocial surveys independently. All items on child and parent psychosocial surveys were pilot-tested with cognitive interviews with children and parents, respectively. Measures used in this study are described here; missing data were low (<4%, n≤5) with the exception of one measure as described.

**Sociodemographic Characteristics.** Parents reported the participant child's ethnicity (Hispanic/non-Hispanic) and race(s) (American Indian or Alaskan Native, Asian, black or African American, Native Hawaiian or Pacific Islander, other, white), their own education level (no high school diploma, high school diploma or equivalent, some college, associate's degree, bachelor's degree, or graduate degree), and whether their family received public assistance (eg, free- or reduced-price lunches; food support/stamps; or Special Supplemental Nutrition Program for Women, Infants, and Children).

**Family Dinner Frequency Measures. Individual item measures.** Family dinner frequency measures included four parent-reported individual items and three child-reported individual items. Each item began with the question stem: "During the past 7 days, how many times..." Items after the question stem were adapted from the literature<sup>3,27-29</sup> for the present study to ask about family dinner frequency, provide a full range of possible responses (ie, 0 to 7), and provide additional meal specifics. For parents, the four items after the question stem were: (1) Did all or most of your family living in your home eat dinner together? (2) Was at least one parent sitting with your child when your child ate his/her dinner? (3) Were you sitting and eating with your child when he/she ate his/her dinner? (4) Were most members of your family sitting and eating dinner together? The three items asked of children varied slightly from parent items to accommodate their cognitive development and were: (5) Did all or most of your family eat dinner together? (6) Did you sit down with other people in your family to eat dinner? and (7) Was at least one parent sitting with you when you ate dinner?

**Summative family dinner frequency scores.** In addition to the seven individual items measuring family meal frequency, we created two family dinner frequency summary scores. Specifically, responses of the four individual parent items were summed to form a parent-reported summative family dinner frequency score ( $\alpha=.92$ ); similarly, responses of the child items were summed to create the child-reported summative family dinner frequency score ( $\alpha=.72$ ).

**Weight Outcome.** Trained study staff objectively measured participant height and weight using standardized protocols and procedures with a stadiometer and calibrated scale.<sup>30</sup> Center for Disease Control Guidelines and Growth Chart Parameters<sup>31</sup> were utilized to calculate age- and sex-adjusted (standardized) BMI z scores (BMIz) using child height and weight data.

**Dietary Outcomes.** Children completed three 24-hour dietary recall interviews (2 weekdays, 1 weekend day) with trained, certified staff using the multiple-pass approach.<sup>32</sup> The first interview was conducted face to face; the next two were scheduled and completed by phone. Staff collected data using Nutrition Data System for Research software

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