HHS Public Access

Author manuscript

J Acad Nutr Diet. Author manuscript; available in PMC 2023 January 01.

Published in final edited form as:

J Acad Nutr Diet. 2022 January ; 122(1): 121–128. doi:10.1016/j.jand.2021.07.002.

Family Characteristics Associated with Preparing and Eating More Family Evening Meals at Home

Melissa L Horning, PhD, RN, PHN[1] [Associate Professor], Sarah Friend, MPH, RD[1] [NU-HOME Project Coordinator], Jiwoo Lee, PhD, RN[1] [Assistant Professor], Colleen Flattum, MS, RD[2] [Division Program Manager], Jayne A Fulkerson, PhD[1] [Professor, Cora Meidl Siehl Endowed Chair in Nursing Research, Affiliate Professor, School of Public Health, Director of the Center for Child & Family Health Promotion Research, Director of the CTSI TRACT TL1 Program and Translational Research Development Program]

[1]School of Nursing, University of Minnesota, 5-140 Weaver Densford Hall, Minneapolis, Minnesota, 55455

[2]Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, 300 West Bank Office Building, 1300 S 2nd St, Minneapolis, Minnesota 55454

Abstract

Background.—Research has demonstrated dietary quality benefits of family meals and meals prepared at home. Less is known about associations between the proportion of family evening meals made at home and key personal, behavioral, and environmental characteristics. Moreover, most studies often measure these data retrospectively.

Objective.—The objective of this study is to describe the proportion of evening meals made at home measured in real-time and to assess associations between personal, behavioral, and environmental characteristics that are associated with a higher proportion of evening meals prepared and consumed at home.

Design.—This study is a cross-sectional secondary analysis of baseline data collected in 2017 and 2018 from the New Ulm at HOME (NU-HOME) study, a randomized controlled trial conducted in rural Minnesota to evaluate the effectiveness of a childhood obesity prevention program for school-age children.

Participants setting.—The present study analyzes a subset of NU-HOME trial data from families (n=108) who completed at least 4 evening meal screeners collected in real-time with ecological momentary assessment technology over a two-week period.

Correspondence: Melissa Horning, University of Minnesota, School of Nursing, 5-140 Weaver Densford Hall, 308 Harvard St SE, Minneapolis, MN 55455; 612-624-1947; horn0199@umn.edu.

Author contributions: JF secured grant funding and led the NU-HOME trial. SF led data collection. MH analyzed the data and wrote the first draft of the manuscript. All authors reviewed and provided substantive feedback on subsequent drafts of the manuscripts.

Conflict of Interest Disclosures: The authors declare no known conflicts of interest.

Main outcome measure.—The main outcome measure was the proportion of family evening meals made at home, calculated using two cut-points (≤50% of evening meals prepared at home versus >50%; ≤70% versus >70%).

Analyses.—Descriptive statistics were used to describe the proportion of evening meals prepared at home. Logistic regression analyses adjusted for parent education were used to assess associations between family characteristics and the two different proportions of meals made at home.

Results.—Most family evening meals were prepared and eaten at home (62%). Logistic regression models indicated meal planning skills (OR=1.19; 95%CI=1.01-1.39) and mealtime routines (OR=1.20, 95%CI=1.03-1.40) were significantly associated with odds of preparing over 50% of evening meals at home. Only meal planning skills (OR=1.27, 95%CI=1.06-1.51) was significantly associated with odds of preparing over 70% of evening meals at home.

Conclusions.—Study findings indicated mealtime routines and meal planning skills were associated with preparing over 50% of evening meals at home, but only meal planning skills were associated with preparing over 70% of evening meals at home, which may suggest the importance of adapting interventions for families. Future research should build upon these findings in randomized controlled trials.

Keywords

ecological momentary assessments; meals prepared at home; meal planning; self-efficacy; cooking

Background

According to the 2020-2025 Dietary Guidelines for Americans, a healthy dietary pattern consists of nutrient-dense foods and beverages across food groups, in recommended amounts, and within calorie limits.[1] Promoting healthy dietary patterns is paramount because they are associated with less risk for chronic conditions like obesity, type 2 diabetes, and hypertension in children and adults.[1] Research suggests having frequent family meals is associated with healthy dietary patterns.[2–4] The foods served at family meals also matter; for example, having fast food for family dinner has been associated with poorer dietary intake in adults[5] and children.[6] There is a growing body of evidence showing that eating foods cooked at home is associated with eating more fruits and vegetables[7] and higher dietary quality[8] among adults. Research has also found serving pre-prepared meals or meals not from scratch in comparison to home cooked meals is associated with serving meals with less fruits, vegetables and whole grains to children[9] and poorer dietary patterns in children[10] and adolescents.[11] Although these research findings are generally consistent across studies, most studies collect meal and preparation data retrospectively versus in real time with a few exceptions,[9,12] increasing potential recall bias. Furthermore, how to support and promote eating more home cooked family meals, especially for families with school-age children is not well-understood.

Aligned with the Social Cognitive Theory,[13] many personal (e.g., self-efficacy for healthy cooking), behavioral (e.g., meal planning skills), and environmental (e.g., mealtime routines, household chaos, home food environment) characteristics have been linked to dietary

patterns. For example, cooking and meal preparation confidence and skills have been linked to less reasons for purchasing prepackaged foods, serving healthier foods, preparing more meals at home, and healthier dietary intake in adults[14–18] and in children.[16,17,19,20] Family environmental characteristics like mealtime routines have been positively associated with healthier diet-related outcomes like child body mass index,[21] while unhealthy home food environments[22] and household chaos[23] have been inversely associated with healthy dietary patterns. These factors are potential intervention targets for facilitating healthy dietary patterns among youth and their parents.

Therefore, it is important to understand how personal, behavioral, and environmental characteristics are associated with preparing and consuming more home cooked family meals to inform development of family-based healthy diet interventions. The present study aims to (1) describe the proportion of family evening meals made at home or other locations measured in real time and (2) assess associations between personal, behavioral, and environmental characteristics with the proportions of evening meals prepared at home.

Methods

The present cross-sectional study analyzed baseline parent data from the New Ulm at HOME (NU-HOME) randomized controlled trial registered with NIH ClinicalTrials.gov (NCT02973815).[24] The NU-HOME trial was held in rural South Central Minnesota and aimed to prevent excess weight gain in 7-10 year old children with a family-focused intervention with 7 monthly sessions and 4 goal-setting calls.[24] The NU-HOME intervention engaged families in promoting healthful meals, snacks and home food environments, positive skills and confidence (e.g., meal planning skills, cooking self-efficacy), and family physical activity through interactive activities (e.g., discussions, physical activity breaks, cooking meals together, parent/child groups, family-style meals).[24] The trial materials and procedures were approved by University of Minnesota Institutional Review Board and Quorum, Institutional Review Board of Allina Health.[24]

In summers 2017 and 2018, dyads of the primary meal preparing parent/guardian (herein: parent) and one 7-10 year old child were recruited for the trial with a variety of methods including: a letter from the local pediatrician sent to families with children in the target age range, flyers, community education brochures, and newspaper articles. Inclusion criteria were that the target parent was the primary meal preparer, the child had to live with the target parent at least half of the time, and the family had to commit to attending intervention sessions if randomized to the intervention group. Exclusion criteria for the trial were planning to move from the area within the next 6 months or having a medical condition that would contraindicate participation in trial intervention activities (e.g., severe food allergy). Study staff screened 144 dyads for eligibility (2 did not meet age criteria; 28 decided not to enroll after learning more about the study); 114 enrolled and completed baseline data collection. If more than one child in a family was eligible, the child participant was selected by a staff member flipping a coin.[24]

Parents and children provided written informed consent and assent. NU-HOME trial measurements included child/parent psychosocial survey measures; a home food inventory;

evening meal screener surveys; child 24-hr dietary recall interviews; child/parent height and weight; and child accelerometry. Information on all trial measures can be found elsewhere,[24] and details are described herein for those directly relevant to the present cross-sectional study aims. Specifically, parents provided household- and parent-level data on a psychosocial survey via an iPad using REDCap software.[25] Parents also completed a Home Food Inventory in their homes.[26] To address the potential for retrospective recall bias, ecological momentary assessment (EMA) technology was used to assess evening meal characteristics. Following in-person, baseline data collection, but prior to learning of study randomization assignment, parents were sent a text via their smart phones with a link to the EMA evening meal screener survey[27] on 7 evenings (7:30pm) using one of six randomized schedules over a two-week period. If parents did not respond, they were sent a follow-up text one hour later. To be included in the present cross-sectional study (N=108), parents had to complete at least 4 of the 7 scheduled evening meal screener surveys at baseline (at least 4 was selected by the research team, as it represented over half of the evening meals per week; this threshold was corroborated in subsequent work[28]); this criterion excluded 6 participating families from analyses (5%).

Measures

Independent variables: personal, behavioral, and environmental characteristics

Meal planning skills.—Parents reported their meal planning skills using a previously validated, 3-item scale (original α=0.90).[29] The scale items were: “I plan meals for [Child’s first name] at least one day in advance;” “I plan meals for [Child’s first name] ahead of time when I know I am going to be busy;” and “I ‘go with the flow’ and do not plan meals for [Child’s first name] or my family.” Items had a 5-point response option (never, rarely, sometimes, often, always). Scale internal consistency in the study sample was α=0.86. Items were (re)coded such that the scale sum indicated higher skills.

Self-efficacy for preparing healthy meals.—Parents reported their self-efficacy for preparing healthy meals using an adapted, 4-item, previously validated scale (original α=0.85).[30] The item stem was, “How likely are YOU to prepare a healthy meal…” with the following scale items “…after a tiring day?” “…when you haven’t been to the store recently?” “…when you feel stressed or tense?” and “…when you do not have access to a recipe?” Items had a 5-point response option (not at all likely, somewhat unlikely, likely, somewhat likely, very likely). Scale internal consistency in the study sample was α=0.83. Items were coded such that the scale sum indicated higher self-efficacy.

Mealtime routines.—Parents reported the mealtime routines within their households using an adapted 6-item, previously-validated scale (original α=0.88, 0.90).[31] The item stem was “Think about a typical evening meal. In my family…” with the following scale items: “…evening mealtime is flexible, people eat when they can;” “…everyone has a specific role and job to do at evening mealtime;” “…everyone is expected to be home for the evening meal;” “…people feel strongly about eating the evening meal together;” “…the evening meal time is just for getting food;” and “…there is little planning around the evening meal time.” Items had a 3-point response option (not true, sort of true, true). Scale internal

consistency in the study sample was α=0.76. Items were (re)coded such that the scale sum indicated more family mealtime routines.

Household chaos.—Parents reported on chaos in their family life using a previously validated, 15-item scale (original α=0.79).[32] Example items from this scale were: "No matter what our family plans, it usually doesn't seem to work out;" "There is very little commotion in our home;" "We almost always seem to be rushed;" and "It's a real zoo in our home." Items had a binary response option (yes, no). Scale internal consistency in the study sample is α=0.83. Items were (re)coded such that a higher score indicated higher chaos.

Obesogenic score.—The validated Home Food Inventory completed by parents allowed for measurement of an obesogenic score, which is a count of the types of foods available in the home that may contribute to obesity (original: Kappa=0.73; Sensitivity=0.83; Specificity=0.91).[26] A higher score indicates more types of obesogenic foods available at home.

Dependent variables: Proportion of evening meals made at home and other meal sources

On the electronic EMA evening meal screener surveys, parents were asked, "Please check the description below that most closely describes your family meal this evening. Most, or a majority of our family members living in our household: (a) were not able to eat together; (b) ate together tonight at a full service restaurant; (c) ate together tonight at a fast food restaurant; (d) ate together tonight and we had pizza/other food delivered to our house; (e) ate together tonight and we picked up take out and brought it home; (f) ate together tonight at someone else's home; or (g) ate together tonight and we made our meal at home."[27] Using this data, the proportion of family evening meals made at home was calculated. Specifically, the total number of times parents responded to category (g) was summed and divided by the total number of evening meal screeners completed over the two-week period. The proportion of evening meals made at home was then dichotomized with two cut-points (≤50% of evening meals prepared at home versus >50%; ≤70% versus >70%) based on the distribution within the sample to enable comparisons of regular family evening meals at home versus most family evening meals at home. A similar approach was used to create variables for the other categories (a-f) to provide context of other meal sources.

Demographic characteristics

Parents self-reported their sociodemographic characteristics on their psychosocial survey including birthdate (used to calculate age), household size, sex, race, ethnicity, and education level using predetermined categories except for birthdate and household size. Multiple responses were allowed for the race categories. Parents also reported on household receipt of economic assistance, defined as responding yes to either of the following questions: "Does your household receive public assistance (like food support/stamps,[33] Electronic Benefit Transfer [EBT],[33] Women, Infants and Children [WIC],[33] Temporary Assistance for Needy Families [TANF],[34] Supplemental Security Income [SSI],[35] or Minnesota Family Investment Program [MFIP])?[36]" OR "Does your child receive free or reduced-price lunches at school?" Additionally, parents reported food insecurity using a

6-item screener scored according to guidelines as food insecure (those with low or very low food security) or food secure (those with marginal or high food security).[37]

Analysis

Descriptive statistics were used to describe all variables. Separate logistic regression models were used to assess associations between the dependent variables (proportion of family evening meals made at home) and each personal, behavioral or environmental characteristic. Logistic regression models were adjusted for sociodemographic characteristics significantly associated with the dependent variables in bivariate analyses (i.e., parent education). Data were analyzed in *SAS* Version 9.4 software.[38] Statistical significance was set at $p<0.05$.

Results

The cross-sectional study sample description is provided in Table 1. Most parents identified as female (98%) and average parent age was 37.8 years; 4% of parents identified as Hispanic/Latinx, and 2% identified as Black, Indigenous or Persons of Color. About half of parents reported an education level at or below an Associates Degree (46%). Slightly over a quarter reported receiving economic assistance (28%) and 18% reported food insecurity. See Table 2 for the descriptive statistics for the independent variables (i.e., personal, behavioral, and environmental characteristics) within the study sample.

To show context of the meal screener data, the mean number of meal screeners completed was 6.6 (SD=0.7; Range 4-7) and the average proportion of family evening meals from various sources/locations are provided in full on Table 2. The primary focus is the average proportion of family evening meals prepared and eaten at home, which was 0.62 (62%; SD=0.23). The next more common sources/locations for meals were: we didn't eat together; we ate together at a someone else's house; and we ate together at a full-service restaurant. The remaining meal sources/locations each comprised less than 0.05 (5%) of the average proportion of evening meals.

Logistic regression models indicated meal planning skills (OR=1.19) were significantly associated with 19% higher odds of preparing over 50% of family evening meals at home and mealtime routines (OR=1.20) were associated with 20% higher odds of preparing over 50% of family evening meals at home (Table 3). Self-efficacy for preparing healthy meals (OR=1.13) was not significantly associated with higher odds of preparing over 50% of family evening meals at home but trended in the expected direction; household chaos and obesogenic score were not significantly related to preparing over 50% of family evening meals at home (Table 3). The only characteristic significantly associated with preparing over 70% of family evening meals at home was meal planning skills; specifically, meal planning skills (OR=1.27) were associated with 27% higher odds of preparing over 70% of family evening meals at home (Table 3).

Discussion

Past research has found having frequent family meals and preparing meals at home have both been associated with better dietary intake and quality.[2–4] However, measurement of

how many family meals are prepared and eaten at home is rarely assessed in real-time. Present study findings from data collected from families with school-age children in real-time using EMA technology indicated 85% of evening meals were eaten together as a family and that parents prepared most (62% on average) of their evening meals at home. These findings help us to better understand more about frequency of preparing family evening meals at home from a real-time capture of data.

Without reliance on data collected retrospectively on preparation of family evening meals at home, this study found family meal routines and parent meal planning skills may facilitate home family evening meal preparation. These findings extend those of previous research, which have found similar associations with different dietary-related outcomes[14–21] (e.g., low meal planning has been associated with more fast-food meals[19] and reasons for purchasing prepackaged foods[18]). While the cut points of greater than 50% and 70% of family evening meals made at home yielded meaningful results in this sample, future research is needed to further examine key cut-points for the proportion of family evening meals prepared at home that differentiate protective associations with outcomes. However, findings may suggest that when working with families who prepare half or less of evening meals at home, fostering meal planning skills and enhancing mealtime routines may be paramount. If findings are corroborated in future randomized controlled trials, interventions with these families could focus on meal planning strategies, including advanced planning for grocery shopping and meals, cooking foods that take longer in larger quantities to provide leftovers, and/or utilizing frozen vegetables.[24,39] Working with parents to enhance routines around mealtime could include strengthening beliefs in prioritizing family meals,[40] creating a positive atmosphere around meals,[41] or establishing family mealtime schedules.[40] When working with families who are already preparing over 70% of family evening meals at home, focusing on skills to plan healthy meals may be the critical intervention target to increase the frequency of family evening meals cooked at home that will likely promote healthy dietary patterns.

Past research suggests the home food environment[22] and household level of chaos[23] are associated with dietary intake outcomes. In contrast, the present study found neither home availability of obesogenic foods nor household chaos was significantly associated with the proportion of family evening meals prepared at home. It is possible this incongruence of findings indicates that the proportion of family evening meals made at home does not fully capture what types of food are offered or eaten at those meals (e.g., whether pre-packaged processed foods are included in the “home cooked” meal). As such, future research should also assess the food options offered during meals prepared at home using real-time data collection and associations with the home food environment and household chaos. Additionally, a recent meta-analysis found other environmental factors (e.g., turning the TV off during meals, having longer duration meals) were influential on children’s nutritional health[41] and may also be important for preparing family evening meals at home, warranting further research.

This study is not without limitations. This cross-sectional study assesses only baseline data so causality cannot be determined. This study is comprised of a homogeneous sample of rural parents who volunteered to participate in a healthy lifestyle intervention; thus, findings

may not generalize to other populations. Survey data were self-reported, and household chaos and mealtime routines were assessed at the family-level rather than for just the target parent and child who participated in measurement. Despite limitations, this study is among the first to assess family meal characteristics using real-time data collected with EMA technology minimizing recall bias. Five important family characteristics related to family evening meals prepared at home were measured. Finally, a high meal screener response rate provided a better understanding of the typical source of families evening meals.

Conclusions

The present study used a novel methodology to assess family evening meals in real-time, which provided a unique opportunity to examine family characteristics associated with the proportion of meals prepared and eaten at home among families with school-age children to inform future intervention studies. Moreover, findings indicated that while mealtime routines and meal planning skills were associated with preparing over 50% of evening meals at home; only meal planning skills were associated with preparing over 70% of evening meals at home, which may indicate need for adapting family interventions based on the proportion of evening family meals prepared at home to meet specific needs of families. Additional research should build upon this work by further evaluating cut points at which the adapting of interventions should occur, should examine findings longitudinally in more diverse populations, and is needed to promote healthy dietary patterns and outcomes.

Acknowledgements:

We would like to acknowledge the families who participated in the NU-HOME trial and the support from the entire community that made the trial possible. We also would like to thank the research team members and student volunteers who contributed to the study: Jennifer Linde, Daheia Barr-Anderson, Abbey Sidebottom, Rebecca Lindberg, Jennifer Beaudette, Rebecca Freese, Justin Clark, Lori Rathburn, Yazmin Cespedes, Jessica Ramos, Christie Martin, Eydie Kramer, Brooke Wagner, Samantha Sommerness, Stephanie Grace, and Amanda Folk.

Funding/support:

This study was supported by Grant R01 HL123699 (J. Fulkerson, PI) from the NHLBI/NIH. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart Lung and Blood Institute of the National Institutes of Health. This study used REDCap to for data collection which was supported by Clinical and Translations Science Institute grant (UL1TR002494) from the National Institutes of Health's National Center for Advancing Translations Sciences.

References

1. U.S. Department of Health and Human Services and U.S. Department of Agriculture. Dietary Guidelines for Americans, 2020-2025. 9th Edition.; 2020. https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf. Accessed June 1, 2021.
2. Fulkerson JA, Larson N, Horning M, Neumark-Sztainer D. A review of associations between family or shared meal frequency and dietary and weight status outcomes across the lifespan. J Nutr Educ Behav. 2014;46(1). doi:10.1016/j.jneb.2013.07.012
3. Hammons AJ, Fiese BH. Is frequency of shared family meals related to the nutritional health of children and adolescents? Pediatrics. 2011;127(6):e1565 LP–e1574. doi:10.1542/peds.2010-1440 [PubMed: 21536618]
4. Robson SM, McCullough MB, Rex S, Munafò MR, Taylor G. Family meal frequency, diet, and family functioning: A systematic review with meta-analyses. J Nutr Educ Behav. 2020;52(5):553–564. doi:10.1016/j.jneb.2019.12.012 [PubMed: 31982371]

5. Sobal J, Hanson K. Family dinner frequency, settings and sources, and body weight in US adults. Appetite. 2014;78:81–88. doi:10.1016/j.appet.2014.03.016 [PubMed: 24681105]
6. Boutelle KN, Fulkerson JA, Neumark-sztainer D, Story M, French SA. Fast food for family meals: Relationships with parent and adolescent food intake, home food availability and weight status. 2007;10(1):16–23. doi:10.1017/S13689800072179410
7. Mills S, Brown H, Wrieden W, White M, Adams J. Frequency of eating home cooked meals and potential benefits for diet and health: Cross-sectional analysis of a population-based cohort study. Int J Behav Nutr Phys Act. 2017;14(109):1–11. doi:10.1186/s12966-017-0567-y [PubMed: 28057008]
8. Wolfson JA, Leung CW, Richardson CR. More frequent cooking at home is associated with higher Healthy Eating Index-2015 score. Public Health Nutr. 2020:1–11. doi:10.1017/S1368980019003549
9. Fertig AR, Loth KA, Trofholz AC, et al. Compared to pre-prepared meals, fully and partly home-cooked meals in diverse families with young children are more likely to include nutritious ingredients. J Acad Nutr Diet. 2019;119(5):818–830. doi:10.1016/j.jand.2018.12.006 [PubMed: 30765316]
10. Altman M, Cahill Holland J, Lundeen D, et al. Reduction in food away from home is associated with improved child relative weight and body composition outcomes and this relation is mediated by changes in diet quality. J Acad Nutr Diet. 2015;115(9):1400–1407. doi:10.1016/j.jand.2015.03.009 [PubMed: 25963602]
11. Overcash F, Davey C, Zhang Y, Reicks M. Evening meal types and family meal characteristics: Associations with demographic characteristics and food intake among adolescents. Nutrients. 2020;12(4). doi:10.3390/nu12040886
12. Berge JM, Beebe M, Smith MC-M, Tate A, Trofholz A, Loth K. Ecological momentary assessment of the breakfast, lunch, and dinner family meal environment in racially/ethnically diverse and immigrant households. J Nutr Educ Behav. 2019;51(6):658–676. doi:10.1016/j.jneb.2019.03.002 [PubMed: 30975582]
13. Bandura A. Social cognitive theory. In: Vasta R, ed. Annals of Child Development. Vol.6. Six Theories of Child Development. Vol 6. Greenwich, CT: JAI Press; 1989:1–60.
14. Reicks M, Trofholz AC, Stang JS, Laska MN. Impact of cooking and home food preparation interventions among adults: Outcomes and implications for future programs. J Nutr Educ Behav. 2014;46(4):259–276. doi:10.1016/j.jneb.2014.02.001 [PubMed: 24703245]
15. Reicks M, Kocher M, Reeder J. Impact of cooking and home food preparation interventions among adults: A systematic review (2011–2016). J Nutr Educ Behav. 2018;50(2): 148–172.e1. doi:10.1016/j.jneb.2017.08.004 [PubMed: 28958671]
16. Hasan B, Thompson WG, Almasri J, et al. The effect of culinary interventions (cooking classes) on dietary intake and behavioral change: A systematic review and evidence map. BMC Nutr. 2019;5(1):29. doi:10.1186/s40795-019-0293-8 [PubMed: 32153942]
17. Wolfson JA, Lahne J, Raj M, Insolera N, Lavelle F, Dean M. Food agency in the United States: Associations with cooking behavior and dietary intake. Nutrients. 2020;12(3):1–18. doi: 10.3390/nu12030877
18. Horning ML, Fulkerson JA, Friend SE, Story M. Reasons parents buy prepackaged, processed meals: It is more complicated than “I don’t have time.” J Nutr Educ Behav. 2017;49(1). doi: 10.1016/j.jneb.2016.08.012
19. Neumark-Sztainer D, MacLehose R, Loth K, Fulkerson JA, Eisenberg ME, Berge J. What’s for dinner? Types of food served at family dinner differ across parent and family characteristics. Public Health Nutr. 2014; 17(1):145–155. doi: 10.1017/S1368980012004594 [PubMed: 23083836]
20. Robson SM, Stough CO, Stark LJ. The impact of a pilot cooking intervention for parent-child dyads on the consumption of foods prepared away from home. Appetite. 2016;99:177–184. doi:10.1016/j.appet.2016.01.021 [PubMed: 26779887]
21. Homing ML, Schow R, Friend SE, Loth K, Neumark-Sztainer D, Fulkerson JA. Family dinner frequency interacts with dinnertime context in associations with child and parent BMI outcomes. J Fam Psychol. 2017;31 (7). doi:10.1037/fam0000330

22. Couch SC, Glanz K, Zhou C, Sallis JF, Saelens BE. Home food environment in relation to children's diet quality and weight status. J Acad Nutr Diet. 2014;114(10):1569–1579.e1. doi:10.1016/j.jand.2014.05.015 [PubMed: 25066057]
23. Fulkerson JA, Telke S, Larson N, Berge J, Sherwood NE, Neumark-Sztainer D. A healthful home food environment: Is it possible amidst household chaos and parental stress? Appetite. 2019; 142:104391. doi: 10.1016/j.appet.2019.104391 [PubMed: 31377322]
24. Fulkerson JA, Homing ML, Barr-Anderson DJ, et al. Universal childhood obesity prevention in a rural community: Study design, methods and baseline participant characteristics of the NU-HOME randomized controlled trial. Contemp Clin Trials. 2021;100(106160). doi: 10.1016/j.cct.2020.106160
25. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377–381. doi: 10.1016/j.jbi.2008.08.010 [PubMed: 18929686]
26. Fulkerson JA, Nelson MC, Lytle L, Moe S, Heitzler C, Pasch KE. The validation of a home food inventory. Int J Behav Nutr Phys Act. 2008;10:1–10. doi: 10.1186/1479-5868-5-55
27. Fulkerson JA, Lytle L, Story M, Moe S, Samuelson A, Weymiller A. Development and validation of a screening instrument to assess the types and quality of foods served at home meals. Int J Behav Nutr Phys Act. 2012;9(1):10. doi:10.1186/1479-5868-9-10 [PubMed: 22313614]
28. Tate A, Trofholz A, Miner M, Berge J. How many days are needed to characterize the healthfulness of a typical dinner meal in direct observational research? JMIR Pediatr Parent. 2020;4. doi:10.2196/22541
29. Storfer-isser A, Musher-eizenman D. Measuring parent time scarcity and fatigue as barriers to meal planning and preparation: Quantitative scale development. J Nutr Educ Behav. 2013;45(2):176–182. doi:10.1016/j.jneb.2012.08.007 [PubMed: 23253605]
30. Beshara M, Hutchinson A, Wilson C. Preparing meals under time stress. The experience of working mothers. Appetite. 2010;55(3):695–700. doi:10.1016/j.appet.2010.10.003 [PubMed: 20937335]
31. Fiese BH, Kline CA. Development of the Family Ritual Questionnaire: Initial reliability and validation studies. J Fam Psychol. 1993;6(3):290–299. doi:10.1037/0893-3200.6.3.290
32. Matheny AP, Wachs TD, Ludwig JL, Phillips K. Bringing order out of chaos: Psychometric characteristics of the confusion, hubbub, and order scale. J Appl Dev Psychol. 1995;16(3):429–444. doi:10.1016/0193-3973(95)90028-4
33. USA Government. Food Assistance. Updated April 15, 2021. Accessed June 1, 2021. https://www.usa.gov/food-help
34. USA Government. Government Benefits. Updated May 24, 2021. Accessed June 1, 2021. https://www.usa.gov/benefits
35. Social Security Administration. Supplemental Security Income. Published 2021. Accessed June 1, 2021. https://www.ssa.gov/ssi/
36. Minnesota Department of Human Services. Minnesota Family Investment Program (MFIP). Updated April 4, 2018. Accessed June 1, 2021. https://mn.gov/dhs/people-we-serve/children-and-families/economic-assistance/income/programs-and-services/mfip.jsp
37. Economic Research Service, United States Department of Agriculture. U.S. Household Food Security Survey Module: Six-Item Short Form September. 2012. https://www.ers.usda.gov/media/8282/short2012.pdf. Accessed January 5, 2021.
38. SAS. 2020:Version 9.4. SAS Institute Incorporated.
39. Flattum C, Draxten M, Horning ML, et al. HOME Plus: Program design and implementation of a family-focused, community-based intervention to promote the frequency and healthfulness of family meals, reduce children's sedentary behavior, and prevent obesity. Int J Behav Nutr Phys Act. Published online 2015:1–9. doi: 10.1186/s12966-015-0211-7 [PubMed: 25592201]
40. McIntosh WA, Kubena KS, Tolle G, Dean WR, Jan J, Anding J. Mothers and meals. The effects of mothers' meal planning and shopping motivations on children's participation in family meals. Appetite. 2010;55(3):623–628. doi:10.1016/j.appet.2010.09.016 [PubMed: 20870001]

41. Dallacker M, Hertwig R, Mata J. Quality matters: A meta-analysis on components of healthy family meals. Health Psychol. 2019;38(12): 1137–1149. doi:10.1037/hea0000801 [PubMed: 31556657]

Research Snapshot

Research questions:

What is the proportion of family evening meals made at home or other locations measured in real-time? Which personal, behavioral and environmental characteristics are associated with a higher proportion of family evening meals prepared at home?

Key Findings:

Most family evening meals were prepared and eaten at home (62%). Logistic regression models indicated meal planning skills (OR=1.19) and mealtime routines (OR=1.20) were significantly associated with odds of preparing over 50% of family evening meals at home. Only meal planning skills (OR=1.27) was significantly associated with odds of preparing over 70% of family evening meals at home.

Table 1.

Household and parent demographic characteristics of the analytic sample of the NU-HOME study who returned at least 4 family evening meal screeners by ecological momentary assessment (N=108) at baseline in 2017 and 2018

Demographic Characteristic	N	%	Mean	SD
Parent Sex				
Male	2	2%		
Female	106	98%		
Parent Age (years)			37.8	5.3
Parent Race				
Black, Indigenous, Persons of Color[a]	2	2%		
White	106	98%		
Parent Ethnicity				
Hispanic/Latinx	4	4%		
Not Hispanic/Latinx	104	96%		
Parent Education				
Some High School, GED, High School Graduate, Associates Degree	50	46%		
Bachelor's degree or higher	58	54%		
Household Receipt of Economic Assistance				
Yes	30	28%		
No	78	72%		
Food Insecurity				
Yes	19	18%		
No	89	82%		
Total number of individuals in the household			4.9	1.4

[a]Includes those who report more than one race.

Table 2.

Personal, behavioral, and environmental characteristics and the proportion of evening meals from various sources/locations of the analytic sample of the NU-HOME study who returned at least 4 family evening meal screeners by ecological momentary assessment (N=108) at baseline in 2017 and 2018

	Study Sample			Possible Range of Scores
Characteristic	**Mean**	**SD**	**Range**	
Personal, behavioral, and environmental characteristics [a]				
Meal planning skills	7.1	2.6	0-12	0-12
Self -efficacy for preparing healthy meals	11.6	3.6	4-20	4-20
Mealtime routines	14.1	2.7	7-18	6-18
Household chaos	5.0	3.6	0-14	0-15
Obesogenic score	25.8	8.1	0-50	0-71
Proportion of family evening meals…				
…prepared and eaten at home	0.62 (62%)	0.23	0-1	0-1
…we didn't eat together	0.15 (15%)	0.20	0-0.83	0-1
…we ate together at someone else's house	0.07 (7%)	0.11	0-0.43	0-1
…we ate together at a full-service restaurant	0.06 (6%)	0.10	0-0.43	0-1
…we ate together at a fast food restaurant	0.04 (4%)	0.09	0-0.33	0-1
…we ate together and had food delivered	0.03 (3%)	0.07	0-0.29	0-1
…we ate together and had food from takeout	0.03 (3%)	0.06	0-0.25	0-1

[a] Higher scores indicate a higher characteristic (e.g., higher meal planning skills, higher self-efficacy for preparing healthy meals, more obesogenic foods present in the home environment).

Table 3.

Personal, behavioral and home environmental characteristics associated with the odds of preparing and eating over 50% and over 70% of meals at home in the analytic sample of the NU-HOME study who returned at least 4 family evening meal screeners by ecological momentary assessment (N=108) at baseline in 2017 and 2018.

	Adjusted odds of preparing >50% of evening meals at home[a,b]	**95% CI**	**Adjusted odds of preparing >70% of evening meals at home**[a,c]	**95% CI**
Meal planning skills	1.19	1.01-1.39*	1.27	1.06-1.51*
Self-efficacy for preparing healthy meals	1.13	1.00-1.27	1.10	0.98-1.23
Mealtime routines	1.20	1.03-1.40*	1.08	0.93-1.25
Household chaos	0.96	0.86-1.08	0.93	0.83-1.04
Obesogenic score	1.00	0.95-1.05	1.00	0.95-1.05

*Indicate significance at p<0.05

[a]All logistic models were adjusted for parent education.

[b]Reference group was those preparing ≤50% of evening meals at home.

[c]Reference group was those preparing ≤70% of evening meals at home.