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Patterns in Mothers' Recollection of Health Care Providers' Young Child Feeding Recommendations

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Abstract

Objective: Characterize feeding guidance mothers recall receiving from their child's health care provider (HCP).

Design: Cross-sectional study of mothers participating in the 2017–2019 National Survey of Family Growth.

Participants: US mothers reporting (n = 1,302) information about their youngest child (aged 6 months to 5 years).

Variables Measured: Weighted percentage of mothers who recalled their child's HCP discussing 6 different feeding topics by demographic characteristics.

Analysis: Logistic regression assessing the relationship between recall of feeding guidance and demographics.

Results: In this sample, 36.9% of mothers (95% confidence interval, 32.3–41.4) recalled HCPs recommending solid food before 6 months old (34.6% at 4–5 months, and 2.3% before 4 months). Mothers who were older or had a higher education level were more likely than their counterparts to recall their HCP discussing several of the feeding topics examined.

Conclusion and Implications: Mothers reported high recollection of early childhood nutrition guidance from their HCP; however, certain topics (eg, appropriate timing of solid food introduction) could be prioritized, and some subpopulations may need additional focus to improve receipt of messages. A better understanding of variability in recall of feeding guidance could provide information for interventions to address barriers to receiving and retaining guidance.

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Keywords

feeding behavior; child nutrition sciences; pediatricians; child guidance

INTRODUCTION

Early feeding patterns can affect long-term health in children.^{1,2} Poor early child nutrition is associated with an increased risk of developing obesity later in life.³ Among children aged 6 months to 4 years, declines in dietary quality can be seen starting as early as 1 year old, as measured by a modified Dietary Quality Index Score.⁴ For example, subcomponent scores decreased with age and were lower for milk, refined grains, vegetables, and whole fruits.⁴

Parents of young children gather information on nutrition and feeding from various sources, including family, friends, media, books, and health care providers or doctors (HCPs). Among these sources, HCPs have a high frequency of contact with children during their first years and are often a trusted source of information.^{5,6} Anticipatory guidance from the HCP on child nutrition and feeding is typically shared with families during well-child visits.⁵ The timing of the introduction of solid food is 1 key element of this feeding guidance. The recommendation is to introduce solid foods at about 6 months of age and not before 4 months.⁷ One study found that 2 modules, 6 sessions each, of early feeding education in which health care professionals provide families with anticipatory guidance may improve child nutrition and feeding behaviors.^{8,9} Other early child feeding topics referenced in the American Academy of Pediatrics' Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents for discussion at health care visits include offering foods with many different tastes and textures, not forcing a child to finish food or bottles, offering a variety of fruits and vegetables, limiting foods and drinks with added sugar, and limiting eating meals in front of the television or other electronics.⁵ These key topics are discussed at varying frequencies during health care visits of children aged 6 months through 5 years and are highly important to a child's growth and development.⁵ Because HCPs can be a trusted and influential source of information, it is important to understand what mothers recall discussing with their child's HCP.

Many studies have characterized HCPs' delivery of nutrition guidance to families of young children.¹⁰⁻¹³ In a 2017 study, a majority of pediatricians and pediatric residents report discussing the following topics with families of children aged < 2 years: avoiding sugar-sweetened beverages (92%), consuming a variety of fruits and vegetables (89%), and exposure to a variety of tastes and textures (66%).¹⁰ Fewer than half of pediatricians and residents reported discussing not forcing a child to finish food or bottles (47%) and limiting meals in front of the television (36%) with families of children under the age of 2 years.¹⁰

Few studies have described what guidance parents recall HCPs discussing. Those studies that characterize families' recall of nutrition topics discussed with HCPs are not focused on specific nutrition topics.^{11,14} For example, a 2005 study looked at the number of nutrition topics recalled by parents from HCPs' discussion of anticipatory guidance among families with children aged 2–11 years but didn't analyze specific topics individually.¹⁴ Other studies on maternal recall have small, non-nationally representative samples.^{15,16} This study fills

existing gaps by analyzing maternal recall of specific nutrition topics discussed with a child's HCP in a nationally representative sample. This study also aims to identify topics with lower recall and sociodemographic characteristics of populations with a lower recall to highlight when resources for improvement could be emphasized or reasons for lack of recall could be further explored in additional studies.

METHODS

Data Source

Data for this analysis came from the 2017–2019 National Survey of Family Growth (NSFG), conducted using a stratified, multistage area probability sample design. Data were collected using in-person, computer-assisted interviewing among a nationally representative sample of men and women aged 15–49 years in the US. Survey topics included reported pregnancies, births, family planning, reproductive health, and child nutrition guidance received. This analysis utilized the female pregnancy data, which included 1 observation per pregnancy reported by each female respondent. The National Survey of Family Growth was conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics with support from programs and agencies within the US Department of Health and Human Services.

Analytic Sample

Among 6,141 women who participated in NSFG 2017–2019, 3,709 women reported at least 1 pregnancy, and the pregnancy file includes records for all 10,215 pregnancies reported by these women. We limited our analyses to women who had a child aged 6 months to 5 years living with them at the time of the survey ($n = 1,632$) because mothers of children outside of this age range were not asked about the recall of feeding guidance. Among mothers with multiple children aged 6 months to 5 years, the older children were excluded ($n = 312$). This was to limit potential recall bias and to simplify the analytic methods required to address multiple observations per mother. Mothers who answered don't know ($n = 18$) to 1 of the feeding questions were excluded. The final analytic sample included 1,302 mothers, each reporting information about their youngest child aged 6 months to 5 years.

Variables of Interest

Feeding variables.—Mothers with a child aged 6 months to 5 years were asked a series of questions related to early feeding guidance provided by a health care provider or doctor (HCP), including if their child's HCP talked to them about when to start feeding solid foods, with response options of yes, no, and don't know. For those who responded yes, the recommended age for introduction was queried; response options were before 4 months of age, 4–5 months of age, or 6 months of age in alignment with the American Academy of Pediatrics Periodic Survey response verbiage.¹⁰ We combined the answers from the categories of before 4 months of age and 4–5 months of age to estimate recalling a recommendation of solid food introduction before 6 months of age.

Respondents were also asked if their child's HCP ever discussed any of the following topics: (1) offering foods with many different tastes and textures, (2) not forcing a child to finish

food or bottles, even if not interested or didn't have much, (3) offering a variety of fruits and vegetables, (4) limiting foods and drinks with added sugar (such as candy, cookies, soda, juice), and (5) limiting eating meals in front of the television or other electronic devices. Mothers could select all that applied, choose none of the above topics, don't know, or refuse to respond. The term recall in this analysis was not used as a metric of a mother's ability to remember information but instead as a proxy of how effectively information is delivered in health care visits and retained by the mother.

Covariates.—Covariates were collapsed for concise reporting of results and interpretability, and referent groups were chosen *a priori* and on the basis of comparability among other studies assessing differences by sociodemographic characteristics. Covariates included maternal age at delivery (< 25 years, 26–30 years, and ≥ 31 years), maternal education level (< high school, some college or above), maternal race/ethnicity (Hispanic, multiple race or non-Hispanic other race, non-Hispanic Black, non-Hispanic White), parity (single life-time birth, 2 or more lifetime births), household income level (< 75% of the federal poverty level, 76% to 185% of the federal poverty level, and > 185% of federal poverty level¹⁷⁻¹⁹), and child's age (6–11 months, 12–23 months, 24–35 months, 36–47 months, 48–71 months). Race was self-reported from options including White, Black or African American, American Indian or Alaska Native, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Other Asian, Native Hawaiian, Guamanian or Chamorro, Samoan, or Other Pacific Islander. Ethnicity was self-reported as either Hispanic/Latina or non-Hispanic. For those who chose Hispanic/Latina, additional options could be selected, including Puerto Rican; Cuban; Mexican, Mexican American, or Chicana; Central or South American; or another Hispanic, Latina, or Spanish origin. Data for this analysis used a publicly available recoded variable that categorized both race and Hispanic origin of respondents. The federal poverty level categories were generated on the basis of the eligibility cutoff for participation in the *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC) (CDC internal communication).

Statistical Analyses

We calculated the percentage of mothers recalling discussion of each feeding topic overall and by each covariate. In addition, a variable was created that summed the number of nutrition topics discussed and was categorized into 3 levels, (1) 0–1 topic discussed, (2) 2–3 topics discussed, and (3) 4–5 topics discussed. Rao Scott chi-square test for independence was used to examine associations between the number of recalled feeding topics with child age (*P* values were set at $\alpha = 0.05$). Multivariable logistic regression was used to calculate adjusted odds ratios (aOR) for each feeding topic while controlling for all other demographic covariates examined. Analyses were completed in SAS (version 9.4, SAS Institute Inc, 2013). The percentages were weighted to be nationally representative. Weights were calculated to adjust for the unequal probability of selecting specific population subgroups, including Hispanic and Black persons and teens, as well as the differential response and coverage rates.²⁰ All analyses accounted for complex sample design using the SAS survey procedure adjusting for clustering, weighting, and stratification as specified by the National Center for Health Statistics.²⁰ Procedures in NSFSG were approved by the National Center for Health Statistic's Ethics Review Board and reviewed by the University

of Michigan Institutional Review Board. Adults received a copy of the informed consent form and asked if they were willing to participate. A waiver was granted for documentation of informed consent for adults by the National Center for Health Statistics's Ethics Review Board. Minors (aged 15–17 years) participating in NSFG required a parent's signature on an informed consent form and permission to participate, whereas minors were required to sign a minor assent form. The Centers for Disease Control and Prevention determined that this secondary analysis of de-identified data was not human subjects research and did not require Institutional Review Board review.

RESULTS

Among the analytic sample, 40% of mothers were aged ≥ 31 years, and 61% completed some college or above (Table 1). Approximately half identified as non-Hispanic White (51%), 25% as Hispanic, 15% as non-Hispanic Black, and 9% as multiple races or non-Hispanic other. Half of the mothers had household income at $> 185\%$ of the federal poverty level (50%), 32% reported income between 76% and 185% of the federal poverty level, and 18% reported income at $\leq 75\%$ of the federal poverty level. More than two-thirds (68%) of mothers in our sample reported >1 birth in their lifetime (parity ≥ 2). One in 10 mothers had a youngest child aged 6–11 months (11%), 27% had a child aged 12–23 months, 19% had a child aged 24–35 months, 23% had a child aged 36–47 months, and 20% had a child aged 48–71 months.

Almost all mothers (91%) recalled HCPs talking to them about when to introduce solid foods (Table 1). Compared with mothers who completed some college or above, mothers with lower education levels were less likely to recall HCPs talking about solid food introduction (aOR, 0.6; 95% confidence interval [CI], 0.4–0.9) after adjusting for other covariates. No other statistically significant differences were found by sociodemographic characteristics.

Among mothers who recalled their HCPs talking about an introduction to solid foods, 63% recalled being recommended to introduce at ≥ 6 months, 35% at 4–5 months, and 2% before 4 months (results not shown in tables). Overall, 37% of mothers who recalled talking about solid food introduction with their child's HCP recalled a recommendation of introduction before 6 months old. After adjusting for covariates, statistically significant differences were found by race/ethnicity and child's age. Compared with mothers who identified as non-Hispanic White, mothers who identified as Hispanic (aOR, 0.3; 95% CI, 0.2–0.5), non-Hispanic Black (aOR, 0.4; 95% CI, 0.2–0.7), or multiple race or non-Hispanic other race (aOR, 0.5; 95% CI, 0.3–0.9) were less likely to recall a recommendation of introducing solid foods before 6 months old after adjusting for all other covariates. Compared with mothers of children aged 48–71 months, mothers of children aged 6–11 months were more likely to recall a recommendation of introducing solid food before 6 months old after adjusting for all other covariates (aOR, 2.7; 95% CI, 1.3–5.7).

More than half of mothers (54%) recalled an HCP discussing 4–5 topics on early feeding guidance, followed by 2–3 topics (31%) and 0–1 topics (14%) (Figure 1). In our sample, 41% of mothers with children aged 6–11 months recalled 4–5 topics, whereas 58% of

mothers with children aged 48–71 months recalled 4–5 nutrition topics being discussed. However, the number of topics recalled did not vary significantly by child age (Rao Scott chi-square, $P = 0.21$).

Tastes and Textures

Three-quarters of mothers recalled their child's HCP discussing offering foods with different tastes and textures (77%) (Table 2). This topic was not statistically different among demographic variables examined after adjusting covariates.

Forcing Food

More than half of mothers recalled discussing not forcing a child to finish food or bottles, even if not interested or didn't have much (60%) with an HCP. This topic was not statistically different among demographic variables examined after adjusting for covariates.

Fruits and Vegetables

In our sample, 85% of mothers recalled discussing offering a variety of fruits and vegetables with their child's HCP. Of the 5 nutrition topics, this topic had the highest percentage of respondents indicating it was discussed. Statistically significant differences were found by race/ethnicity after adjusting for covariates. Compared with mothers who identified as non-Hispanic White mothers, mothers who identified as Hispanic were less likely to recall this topic after adjusting for other covariates (aOR, 0.6; 95% CI, 0.4–0.9).

Limiting Added Sugar

Among mothers in our sample, three-quarters recalled discussing limiting foods and drinks with added sugar (such as candy, cookies, soda, and juice) (77%). After adjusting for covariates, statistically significant differences were found by maternal age, race/ethnicity, and child's age. Compared with mothers aged 31 years, mothers aged 25 years or 26–30 years were less likely to recall this topic after adjusting for other covariates (aOR, 0.6; 95% CI, 0.4–0.9 for both groups). Compared with mothers who identified as non-Hispanic White, mothers who identified as Hispanic were less likely to recall this topic after adjusting for other covariates (aOR, 0.6; 95% CI, 0.4–0.9). Compared with mothers of children aged 48–71 months, mothers of children aged 6–11 months were less likely to recall this topic after adjusting for other covariates (aOR, 0.3; 95% CI, 0.1–0.7).

Limiting Eating in Front of Electronics

Less than half (43%) of mothers in our sample recalled discussing limiting eating meals in front of the television or other electronic devices with their child's HCP. This topic was not statistically different among demographic variables examined after adjusting for covariates.

None of the Above

Of mothers in our sample, 7% recalled none of the topics listed being discussed with their child's HCP. This topic was not statistically different among demographic variables examined after adjusting for covariates.

DISCUSSION

We examined feeding recommendations that mothers of children aged 6 months to 5 years recalled hearing from their child's HCP. Mothers with higher education levels were more likely to recall discussing solid food introduction. Of mothers who recalled HCPs discussing when to start solid foods, more than one-third recalled HCPs recommending the introduction of solid foods before 6 months (35% at 4–5 months, and 2% before 4 months), which could be counter to pediatric feeding guidelines.^{7,21} Before 6 months old, a child can receive the necessary nutrition from breast milk or formula alone.²² Introduction of solid foods at 4 months is associated with higher body mass index and greater odds of obesity later in childhood than the introduction of solid foods at 6 months old.²²

Overall, mothers reported high recollection of 5 different feeding topics with differences noted by sociodemographic characteristics. For some topics, mothers who were older (≥ 31 years) or self-identified as non-Hispanic White were more likely to recall discussion of several different feeding topics than those who were younger (< 31 years) or identified as Hispanic after adjusting for other covariates. Child's age also had a relationship with topic recall after adjusting for other covariates. This aligns with the concept of timing of delivering developmentally appropriate feeding guidance. Limiting meals in front of electronic devices and not forcing a child to finish food were the least common topics mothers recalled discussing with their HCP. In addition, limiting food and drink with added sugar had the most significant variability by sociodemographic characteristics. About 7% of mothers did not recall their child's HCP discussing any of the 5 feeding topics examined.

The American Academy of Pediatrics recommends 14 preventive health visits from birth through 5 years,⁵ providing multiple opportunities to discuss feeding with the child's HCP. With a high frequency of contact and existing trust,⁶ HCPs are a respected source of feeding recommendations for mothers and have a high potential for impact on feeding behaviors.^{8,9} Multiple factors may affect the receipt and recall of early child feeding guidance.

Health care providers can face structural barriers to providing advice. One contributing factor is HCPs' time constraints. Pediatricians report spending an average of 18.3 minutes with the child and parent during well-child visits.¹¹ Pediatricians who reported well-child visit durations above the median (18 minutes) discussed a greater number of anticipatory recommendations.¹¹ However, in a qualitative study, pediatricians expressed frustration with the limited time they have per visit and the gaps in frequency between visits when feeding practices are rapidly changing for a patient.²³ Providers have multiple anticipatory guidance topics to cover in each visit, beyond feeding practices, conducting a physical examination, and addressing any acute health issues.⁵ The guidance delivered and discussed at a visit also varies on the basis of relevance to a child's age and development and a parent's current concerns.⁵ Given the limited time HCPs have because of their high patient loads and other administrative responsibilities, it may be unrealistic to expect HCPs to be the sole source of early feeding guidance. Our data indicate gaps in the recall of early child nutrition messages from HCPs, specifically regarding not forcing food and eating in front of electronic devices.

Innovative strategies tailored to families' needs that alleviate the HCP burden could enhance parental recall, consistency, and efficiency of guidance delivery.²⁴ In a survey of pediatricians (n = 502), many supported changes to the current well-child care system.²⁵ Specifically, 58% of pediatricians felt an ideal well-child care system would rely on non-physicians providing anticipatory guidance.²⁵ Innovative approaches to delivering well-child feeding guidance include using a parent coach,²⁶ other health care professionals and care providers,²⁷ mobile applications,²⁸ group well-child visits,²⁹ and multifaceted approaches that combine several innovations.^{30,31} For example, in a randomized control trial including 251 parents with low income, a parent health educator was used at well-child visits to provide anticipatory guidance alongside an automated text messaging service with age-appropriate health messages, web-based tools, and a brief problem-focused visit with the pediatric clinician.²⁶ Parents involved in this intervention scored higher on receipt of all preventive care measures compared with parents receiving standard well-child care.²⁶ An additional systematic review showed improvements in anticipatory guidance knowledge through trained nonphysician providers or web-based tools, including websites and prerecorded phone services.²⁷ Group well-child visits could also improve attendance at visits, provide equal or superior anticipatory guidance delivery compared with 1-on-1 well-child visits, and take less physician time.^{27,29}

Access to health care services could also affect a mother's receipt and recall of early feeding guidance from HCPs. If a mother never saw an HCP with her child, she would not have received or recalled discussing early feeding guidance. Missed primary care visits can occur for many reasons, including insurance status,³²⁻³⁶ lack of a usual source of care (medical home),^{35,37} lack of transportation,³⁶ or having multiple children.³⁶ Addressing structural and systematic barriers to accessing primary health care, such as awareness of federal insurance programs and public transportation, might improve the likelihood of mothers' receipt/recall of feeding guidance through increased attendance at well-child visits.

In addition to structural barriers to receiving feeding guidance, there are other considerations for enhancing maternal recall, such as the volume of information disseminated in visits and counseling methods.^{14,31,38} In a study on concordance between provider and parent recall of anticipatory guidance provided at visits, there was high agreement on which topics were discussed, but the parental recall of topics decreased as the number of topics discussed at a visit increased.¹⁴ In addition, variations of motivational interviewing have been demonstrated to positively affect recommendation dissemination and behavior change in the pediatric primary care setting.^{31,38} Specifically, when a health educator conducted a series of motivational counseling phone calls in tandem with a brief negotiation session with an HCP, and parenting workshops, fewer mothers of infants reported the early introduction of solid foods before 4 months old compared with the control group (57% vs 82%; $P = 0.04$).³¹ Thus, interventions that optimize how much guidance is disseminated at a given visit and how HCPs deliver guidance could help improve maternal recall of feeding guidance.

We found differences in recall by specific demographic factors, similar to other existing studies. In a 2004 study of parents of children aged 4–35 months in the National Survey of Early Childhood Health, recall of feeding guidance differed by demographic characteristics.

More specifically, in this 2004 study, an unmet need was defined by a parent's report of not recalling receipt of guidance on a topic but feeling that a discussion of that topic would have been helpful.¹¹ Among parents of children aged 10 to 35 months in the National Survey of Early Childhood Health, Black and Hispanic parents, low-income parents, uninsured parents, and parents with less than a high school degree reported the greatest unmet needs.¹¹ Similarly, among a sample of mothers with low incomes participating in *Head Start* (n = 20), only 30% (n = 6) recalled receiving nutrition-related guidance.¹⁵ These findings corroborate some of the sociodemographic differences in our sample, emphasizing low education levels and Hispanic parents as priority populations for interventions that improve receiving information from HCPs.

Specific subgroups can be prioritized by enhancing the quality of messaging through culturally relevant and vivid messaging.^{39,40} In a qualitative interview study, HCPs explained a need for more culturally relevant, visually interesting, engaging materials at appropriate literacy levels to enhance patient-provider communication.³⁹ These resources could help achieve a more equitable recall of child feeding guidance. In addition, in a sample of adults with low income, memorable nutrition messages were characterized as vivid and personally relevant to the audience.⁴⁰ More interventional studies could be conducted to determine a provider's best practices that promote recall of messages in priority populations.

This study includes several limitations. Because of the nature of the survey questions, we do not know if messages were not shared by a child's HCP or were shared and not recalled; if a mother had access to an HCP and attended any visits; if the feeding guidance a mother recalled came from another source such as a WIC provider, should she be eligible; or if a mother implemented the various recommendations. Although we lacked data on behaviors implemented by these families and the sources of their information, a better understanding of the topics recalled could guide interventions that use the clinical setting to educate caregivers on early feeding. In addition, some mothers answered the survey questions for multiple pregnancies/children, which might have made it difficult to remember which child they received information about in health care visits. Although we selected the youngest child to include in the sample, recall bias is still possible. These survey questions are asked of mothers of children aged 6 months to 5 years. Children in this age range are at different developmental stages and have different feeding needs. Some of the surveyed feeding topics might not be developmentally appropriate or relevant for some children in this sample based on their age (specifically eating in front of the television, forcing food, and solid food introduction), making it unlikely they received the information; however, analyses were stratified by children's age. If following the periodicity schedule, older children would have had a higher number of health care visits resulting in more opportunities to receive guidance or a longer period because receiving certain guidance may influence recall.

Similarly, because of sample size limitations, the response for recall of solid foods timing was combined to include before 4 months and 4–5 months. Although the American Academy of Pediatrics recommends introduction at about 6 months, there could be situations in which it may be indicated to introduce solid foods at 4–5 months old. It is important to consider this caveat when interpreting Table 1. Finally, mothers self-selected their race and ethnicity from predetermined categories. Mothers may not have identified

with the provided categories and selected a category (or categories) that was not their preferred. This should be considered when reviewing results presented by race and ethnicity.

This analysis offers several strengths. Our sample size was relatively large and was a nationally representative sample. Finally, very little research has been done on what feeding guidance parents and caregivers recall being told by HCPs. Our findings fill gaps in existing research by examining the receipt of information from the mother's perspective and providing information on sociodemographic differences in the information mothers reported receiving.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Although most mothers in our sample recalled receiving early childhood nutrition guidance from their HCP, certain priority areas could be addressed in practice, such as messaging surrounding eating in front of electronic devices, not forcing food, and appropriate timing of solid food introduction. In addition, subpopulations such as mothers of younger age, lower education status, and certain racial/ethnic groups could be prioritized for improving the receipt of certain messages. Additional research could be done to better understand the causes of differences in recall in subgroups. Specifically, further research could determine if the cause of not recalling information was because of limited or no interactions with the HCP, the HCP not providing information during well-child visits, or the parent not remembering the information when it was provided. Understanding this will help determine what types of interventions might be most impactful. Finally, other datasets could explore the relationship between recall of HCP advice and practice of recommended behaviors which was not available in NSFG.

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REFERENCES

1. Koletzko B, Brands B, Poston L, Godfrey K, Demmelmair H. Early Nutrition Project. P. Early nutrition programming of long-term health. *Proc Nutr Soc.* 2012;71:371–378. [PubMed: 22703585]
2. Koletzko B, Godfrey KM, Poston L, et al. Nutrition during pregnancy, lactation and early childhood and its implications for maternal and long-term child health: the early nutrition project recommendations. *Ann Nutr Metab.* 2019;74:93–106. [PubMed: 30673669]
3. Pan L, Li R, Park S, Galuska DA, Sherry B, Freedman DS. A longitudinal analysis of sugar-sweetened beverage intake in infancy and obesity at 6 years. *Pediatrics.* 2014;134(1):S29–S35. suppl. [PubMed: 25183752]
4. Hamner HC, Moore LV. Dietary quality among children from 6 months to 4 years, NHANES 2011–2016. *Am J Clin Nutr.* 2020;111:61–69. [PubMed: 31665202]
5. Hagan J, Shaw J, Duncan P. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents.* 4th ed. American Academy of Pediatrics; 2017.
6. Glanz JM, Wagner NM, Narwaney KJ, et al. A mixed methods study of parental vaccine decision making and parent-provider trust. *Acad Pediatr.* 2013;13:481–488. [PubMed: 24011751]

7. US Department of Agriculture, US Department of Health and Human Services. Dietary Guidelines for Americans, 2020–2025. US Department of Health and Human Services and US Department of Agriculture; 2015.
8. Magarey A, Mauch C, Mallan K, et al. Child dietary and eating behavior out-comes up to 3.5 years after an early feeding intervention: the NOURISH RCT. *Obesity (Silver Spring)*. 2016;24:1537–1545. [PubMed: 27193736]
9. Daniels LA, Mallan KM, Battistutta D, et al. Child eating behavior outcomes of an early feeding intervention to reduce risk indicators for child obesity: the NOURISH RCT. *Obesity (Silver Spring)*. 2014;22:E104–E111. [PubMed: 24415390]
10. Boundy EO, Fisher Boyd A, Hamner HC, et al. US pediatrician practices on early nutrition, feeding, and growth. *J Nutr Educ Behav*. 2020;52:31–38. [PubMed: 31759892]
11. Olson LM, Inkelas M, Halfon N, Schuster MA, O'Connor KG, Mistry R. Overview of the content of health supervision for young children: reports from parents and pediatricians. *Pediatrics*. 2004;113:1907–1916. Suppl. [PubMed: 15173461]
12. Rattay KT, Fulton JE, Galuska DA. Weight counseling patterns of U.S. Pediatricians. *Obes Res*. 2004;12:161–169. [PubMed: 14742855]
13. Galuska DA, Fulton JE, Powell KE, et al. Pediatrician counseling about preventive health topics: results from the Physicians' Practices Survey, 1998–1999. *Pediatrics*. 2002;109:e83. [PubMed: 11986489]
14. Barkin SL, Scheindlin B, Brown C, Ip E, Finch S, Wasserman RC. Anticipatory guidance topics: are more better? *Ambul Pediatr*. 2005;5:372–376. [PubMed: 16302840]
15. Woolford SJ, Clark SJ, Lumeng JC, Williams DR, Davis MM. Maternal perspectives on growth and nutrition counseling provided at preschool well-child visits. *J Natl Med Assoc*. 2007;99:153–158. [PubMed: 17366952]
16. Crocetti M, Dudas R, Krugman S. Parental beliefs and practices regarding early introduction of solid foods to their children. *Clin Pediatr (Phila)*. 2004;43:541–547. [PubMed: 15248007]
17. US Census Bureau. Poverty thresholds for 2016 by size of family and number of related children under 18 years. <https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-poverty-thresholds/thresh16.xls>. Accessed May 14, 2022.
18. US Census Bureau. Poverty thresholds for 2017 by size of family and number of related children under 18 years. <https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-poverty-thresholds/thresh17.xls>. Accessed May 14, 2022.
19. US Census Bureau. Poverty. Poverty thresholds for 2018 by size of family and number of related children under 18 years. <https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-poverty-thresholds/thresh18.xls>. Accessed May 14, 2022.
20. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. Public-use Data File Documentation 2017–2019: National Survey of Family Growth. CDC National Center for Health Statistics; 2020. <https://www.cdc.gov/nchs/data/nsfg/NSFG-2017-2019-UG-MainText-508.pdf>. Accessed May 24, 2022.
21. Complementary feeding. In: Kleinman RE, Greer FR, eds. *Pediatric Nutrition*, 8th ed, American Academy of Pediatrics; 2019:163–186.
22. D'Hollander CJ, Keown-Stoneman CDG, Birken CS, O'Connor DL, Maguire JL. TARGet Kids! collaboration. Timing of introduction to solid food, growth, and nutrition risk in later childhood. *J Pediatr*. 2022;240:102–109. e3. [PubMed: 34481809]
23. Olson BH, Horodyski MA, Brophy-Herb H, Iwanski KC. Health professionals' perspectives on the infant feeding practices of low income mothers. *Matern Child Health J*. 2010;14:75–85. [PubMed: 18982434]
24. Glascoe FP, Trimm F. Brief approaches to developmental-behavioral promotion in primary care: updates on methods and technology. *Pediatrics*. 2014;133:884–897. [PubMed: 24777220]
25. Coker T, Casalino LP, Alexander GC, Lantos J. Should our well-child care system be redesigned? A national survey of pediatricians. *Pediatrics*. 2006;118:1852–1857. [PubMed: 17079554]
26. Coker TR, Chacon S, Elliott MN, et al. A parent coach model for well-child care among low-income children: a randomized controlled trial. *Pediatrics*. 2016;137:e20153013. [PubMed: 26908675]

27. Coker TR, Windon A, Moreno C, Schuster MA, Chung PJ. Well-child care clinical practice redesign for young children: a systematic review of strategies and tools. *Pediatrics*. 2013;131(1):S5–25. suppl. [PubMed: 23457149]
28. Dienelt K, Moores CJ, Miller J, Mehta K. An investigation into the use of infant feeding tracker apps by breast-feeding mothers. *Health Inform J*. 2020;26:1672–1683.
29. Fenick AM, Leventhal JM, Gilliam W, Rosenthal MS. A randomized controlled trial of group well-child care: improved attendance and vaccination timeliness. *Clin Pediatr (Phila)*. 2020;59:686–691. [PubMed: 32107935]
30. Taveras EM, Gortmaker SL, Hohman KH, et al. Randomized controlled trial to improve primary care to prevent and manage childhood obesity: the High Five for Kids study. *Arch Pediatr Adolesc Med*. 2011;165:714–722. [PubMed: 21464376]
31. Taveras EM, Blackburn K, Gillman MW, et al. First steps for mommy and me: a pilot intervention to improve nutrition and physical activity behaviors of postpartum mothers and their infants. *Matern Child Health J*. 2011;15:1217–1227. [PubMed: 20957514]
32. Cohen RA, Terlizzi EP, Cha AE, Martinez ME. Health Insurance Coverage: Early Release of Estimates From the National Health Interview Survey, 2020. National Center for Health Statistics; 2020. <https://www.cdc.gov/nchs/data/nhis/earlyrelease/insur202108508.pdf#:~:text=Health%20Insurance%20Coverage%3A%20Early%20Release%20of%20Estimates%20From,coverage%20at%20the%20time%20of%20interview%20%28Figure%20%29.> Accessed March 22, 2022.
33. Alker JC, Kenney GM, Rosenbaum S. Children’s health insurance coverage: progress, problems, and priorities for 2021 and beyond. *Health Aff (Millwood)*. 2020;39:1743–1751. [PubMed: 33017236]
34. Haley JM, KG Pan CW, Wang R, Lynch V, Buettgens M. Progress in Children’s Coverage Continued to Stall Out. Urban Institute; 2020. <https://www.urban.org/sites/default/files/publication/102983/progress-in-childrens-coverage-continued-stalling-out-in-2018.pdf>. Accessed March 22, 2022.
35. DeVoe JE, Tillotson CJ, Wallace LS, Lesko SE, Pandhi N. Is health insurance enough? A usual source of care may be more important to ensure a child receives preventive health counseling. *Matern Child Health J*. 2012;16:306–315. [PubMed: 21373938]
36. Wolf ER, Donahue E, Sabo RT, Nelson BB, Krist AH. Barriers to attendance of prenatal and well-child visits. *Acad Pediatr*. 2021;21:955–960. [PubMed: 33279734]
37. Romaine MA, Bell JF. The medical home, preventive care screenings, and counseling for children: evidence from the Medical Expenditure Panel Survey. *Acad Pediatr*. 2010;10:338–345. [PubMed: 20675211]
38. Daniels SR, Hassink SG. Committee on Nutrition. The role of the pediatrician in primary prevention of obesity. *Pediatrics*. 2015;136:e275–e292. [PubMed: 26122812]
39. Heller RL, Chiero JD, Trout N, Mobley AR. A qualitative study of providers’ perceptions of parental feeding practices of infants and toddlers to prevent childhood obesity. *BMC Public Health*. 2021;21:1276. [PubMed: 34193104]
40. Davis LA, Morgan SE, Mobley AR. The utility of the memorable messages framework as an intermediary evaluation tool for fruit and vegetable consumption in a nutrition Education Program. *Health Educ Behav*. 2016;43:321–327. [PubMed: 26317229]

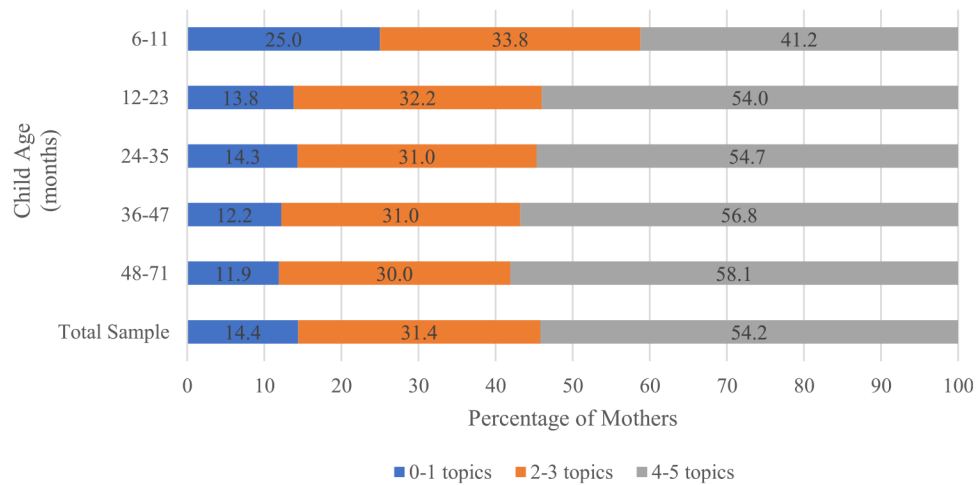


Figure 1.

Mothers' reported total number of feeding guidance topics discussed with child's health care provider by child's age. Mother's recollection of a child's health care provider discussing 0–1 child feeding topic, 2–3 topics, or 4–5 topics were stratified by child's age at interview, represented in a stacked bar chart, and tested for significance using a chi-square test for independence. Among all mothers reporting on their youngest child aged 6 months to 5 years old who lives with them, more than half (54.2%) recalled the discussion of 4 to 5 child feeding topics. The number of topics recalled by a mother did not differ significantly by child age (Rao Scott chi-square test for independence; $P = 0.21$).

Mothers' Recall of Their Child's Health Care Provider Talking About When to Introduce Solid Foods^a and Recommending Introduction Before 6 mo of Age, ^b National Survey of Family Growth, US, 2017–2019

Table 1.

Variables	Mothers ^c Recalling Health Care Provider's Discussion of Solid Food Introduction		Mothers ^b Recalling Health Care Provider's Recommendation of Solid Food Introduction Before 6 mo of Age	
	n (%)	Weighted Percentage (95% CI)	n (%)	Weighted Percentage (95% CI)
Total sample	1,302	91.4 (89.1–93.8)	1,184	36.9 (32.3–41.4)
Maternal age at delivery (y)				
25	443 (27.6)	92.1 (89.6–94.6)	400 (27.8)	32.2 (24.8–39.5)
26–30	397 (32.6)	90.3 (85.7–94.8)	364 (32.2)	36.2 (27.2–45.1)
31	462 (39.8)	91.9 (88.7–95.2)	420 (40.0)	40.7 (34.0–47.5)
Maternal education ^e				
High school	610 (38.9)	88.7 (84.8–92.6)	545 (37.7)	31.4 (24.0–38.9)
Some college or above	692 (61.1)	93.2 (90.4–95.9)	639 (62.3)	40.2 (34.7–45.7)
Maternal race/ethnicity ^e				
Hispanic	431 (25.3)	91.4 (86.2–96.5)	399 (25.3)	22.2 (15.6–28.7)
Multiple or non-Hispanic other race	106 (8.7)	95.4 (90.8–100.0)	100 (9.1)	31.6 (17.6–45.7)
Non-Hispanic Black	266 (14.8)	92.7 (89.0–96.4)	240 (15.0)	25.8 (17.7–33.9)
Non-Hispanic White	499 (51.2)	90.4 (86.8–94.0)	445 (50.7)	48.4 (42.4–54.5)
Parity ^e				
Single lifetime birth	383 (32.2)	93.1 (88.4–97.8)	361 (32.8)	40.4 (33.4–47.5)
Multiple lifetime births	919 (67.8)	90.6 (88.0–93.2)	823 (67.2)	35.1 (29.8–40.5)
Household income, ^e % FPL				
75%	316 (17.7)	86.7 (80.4–93.0)	277 (16.7)	25.2 (16.3–34.1)
76% to 185%	437 (32.2)	91.7 (88.0–95.4)	395 (32.3)	32.7 (25.1–40.3)
> 185%	549 (50.2)	93.0 (89.5–96.4)	512 (51.0)	43.4 (37.6–49.2)
Child age (mo) ^e				
6–11	138 (10.9)	89.9 (82.9–96.8)	123 (10.7)	50.7 (36.1–65.4)
12–23	345 (27.0)	92.2 (87.8–96.5)	317 (27.2)	37.5 (28.2–46.9)
				2.7* (1.3–5.7)
				1.3 (0.8–2.3)

Variables	Mothers ^d Recalling Health Care Provider's Discussion of Solid Food Introduction		Mothers ^d Recalling Health Care Provider's Recommendation of Solid Food Introduction Before 6 mo of Age	
	n (%)	Weighted Percentage (95% CI)	n (%)	Weighted Percentage (95% CI)
24–35	288 (19.1)	92.4 (88.2–96.6)	266 (19.3)	31.8 (23.2–40.3)
36–47	284 (23.0)	88.7 (82.7–94.7)	252 (22.3)	38.4 (29.1–47.6)
48–71	247 (20.0)	93.6 (89.9–97.3)	226 (20.5)	31.9 (22.9–40.9)
				Reference

aOR indicates adjusted odds ratio; CI, confidence interval; FPL, federal poverty level.

^aDenominator includes mothers reporting information about their youngest child aged 6 mo to 5 y who lives with them

^bDenominator is mothers in our analytic sample recall discussing when to introduce solid foods with their health care provider (n = 1,184). Numerator combines mothers who recall their health care provider recommending introduction before 4 mo or at 4–5 mo of age

^cOdds of mother recalling health care provider talking about solid food introduction after adjusting for all other covariates in this table

^dOdds of mother recalling health care provider recommending the introduction of solid foods before 6 mo of age after adjusting for all other covariates in this table

^eVariable reflects information captured at the time of the interview

* Statistical significance based on 95% CI. Calculated using multivariable logistic regression after adjusting for all covariates included in this table.

Table 2.

Mothers' ^aRecall of Early Feeding Guidance Topics Discussed at Health Care Visits by Select Demographic Characteristics (n = 1,302), National Survey of Family Growth, US, 2017–2019

Characteristics	n	Offering Foods With Many Different Tastes and Textures					Not Forcing a Child to Finish Food or Bottles, Even if Not Interested or Didn't Have Much					Offering a Variety of Fruits and Vegetables					Limiting Foods and Drinks With Added Sugar (eg, Candy, Cookies, Soda, Juice)					Limiting Eating Meals in Front of Television or Other Electronic Devices					None of These Topics				
		Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)	aOR ^b (95% CI)	Weighted % (95% CI)					
Total n	1,302	76.6 (73.5–79.8)	95.5	59.5 (55.6–63.4)	84.7 (81.6–87.8)	76.5 (72.8–80.3)	42.9 (38.3–47.4)	7.1 (5.4–8.9)																							
Maternal age at delivery (y)																															
25	443	68.7 (61.2–76.1)	0.6 (0.4–1.0)	59.9 (53.3–66.6)	0.9 (0.6–1.3)	83.4 (79.4–87.4)	0.7 (0.5–1.2)	74.1 (68.5–79.6)	0.6* (0.4–0.9)	42.7 (35.8–49.6)	1.0 (0.7–1.5)	6.9 (4.2–9.5)	0.9 (0.5–1.7)																		
26–30	397	78.4 (73.2–83.6)	0.9 (0.6–1.5)	55.6 (48.9–62.3)	0.8 (0.5–1.1)	81.9 (76.6–87.3)	0.6 (0.4–1.0)	72.6 (66.1–79.1)	0.6* (0.4–0.9)	42.4 (35.5–49.2)	1.0 (0.6–1.5)	7.0 (4.0–10.1)	0.9 (0.5–1.6)																		
31	462	80.7 (76.1–85.4)	Reference	62.4 (56.2–68.7)	Reference	87.9 (83.9–91.9)	Reference	81.5 (76.6–86.4)	Reference	43.4 (35.4–51.3)	Reference	7.4 (4.8–10.1)	Reference																		
Maternal education ^c																															
High school	610	70.9 (64.8–77.0)	0.8 (0.5–1.2)	58.4 (53.2–63.5)	1.1 (0.7–1.5)	79.4 (74.6–84.3)	0.7 (0.5–1.0)	74.3 (69.0–79.6)	1.0 (0.7–1.4)	41.7 (35.6–47.7)	0.9 (0.6–1.3)	9.2 (6.6–11.8)	1.6 (1.0–2.7)																		
Some college or above	692	80.3 (76.3–84.3)	Reference	60.3 (54.7–65.8)	Reference	88.0 (85.2–90.9)	Reference	77.9 (73.4–82.5)	Reference	43.6 (38.2–49.0)	Reference	5.8 (3.7–8.0)	Reference																		
Maternal race/ethnicity ^c																															
Hispanic	431	70.9 (65.5–76.2)	0.8 (0.5–1.2)	52.6 (45.3–59.9)	0.7 (0.5–1.1)	76.5 (70.8–82.2)	0.6* (0.4–0.9)	68.5 (62.3–74.8)	0.6* (0.4–0.9)	38.0 (31.8–44.2)	0.7 (0.5–1.1)	7.7 (4.5–11.0)	0.7 (0.4–1.3)																		
Multiple, Non-Hispanic other	106	82.5 (75.5–89.5)	1.2 (0.8–2.0)	67.6 (59.0–76.2)	1.2 (0.8–1.9)	90.2 (83.9–96.5)	1.3 (0.5–3.0)	71.9 (58.4–85.4)	0.6 (0.3–1.2)	31.3 (19.7–42.9)	0.6 (0.3–1.0)	4.3 (0.3–8.2)	0.7 (0.2–1.9)																		

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Characteristics	n	Offering Foods With Many Different Tastes and Textures	Not Forcing a Child to Finish Food or Bottles, Even if Not Interested or Didn't Have Much	Offering a Variety of Fruits and Vegetables	Limiting Foods and Drinks With Added Sugar (eg, Candy, Cookies, Soda, Juice)	Limiting Eating Meals in Front of Television or Other Electronic Devices	None of These Topics	Weighted % (95% CI)	
Non-Hispanic Black	266	75.9 (68.6–83.3)	57.9 (47.4–68.3)	89.1 (83.1–95.2)	84.3 (78.7–90.0)	50.5 (42.3–58.7)	4.6 (1.9–7.2)	0.5 (0.2–1.0)	
Non-Hispanic White	499	78.7 (73.9–83.6)	62.0 (56.1–67.9)	86.6 (82.7–90.5)	79.0 (74.0–84.1)	45.0 (37.8–52.2)	8.1 (5.4–10.8)	Reference	Reference
Parity ^c									
Single lifetime birth	383	75.1 (69.3–81.0)	61.3 (52.9–69.8)	87.9 (83.2–92.7)	77.4 (71.7–83.2)	40.0 (31.6–48.3)	4.3 (2.0–6.7)	0.5 (0.3–1.0)	Reference
Multiple lifetime births	919	77.4 (74.0–80.7)	58.7 (54.5–62.8)	83.2 (79.6–86.8)	76.1 (71.8–80.4)	44.2 (39.1–49.3)	8.5 (6.3–10.7)	Reference	Reference
Household income, ^c % FPL									
75%	316	65.7 (57.4–73.9)	52.3 (44.4–60.3)	79.7 (71.6–87.8)	75.4 (69.0–81.8)	38.8 (32.4–45.2)	8.9 (4.4–13.4)	1.3 (0.5–3.2)	Reference
76% to 185%	437	76.9 (70.5–83.3)	62.2 (55.2–69.2)	82.6 (77.2–88.0)	74.6 (68.3–80.9)	47.2 (40.3–54.2)	7.7 (4.4–10.9)	1.1 (0.6–2.1)	Reference
> 185%	549	80.3 (75.5–85.2)	60.3 (53.8–66.9)	87.8 (84.7–91.0)	78.2 (73.2–83.2)	41.5 (34.9–48.1)	6.2 (3.9–8.5)	Reference	Reference
Child's age (mo) ^c									
6–11	138	66.4 (55.9–76.9)	53.5 (42.7–64.3)	76.8 (68.8–84.9)	56.0 (41.5–70.5)	38.4 (25.5–51.3)	15.5 (7.9–23.0)	1.9 (0.8–4.4)	Reference
12–23	345	76.9 (70.2–83.6)	61.1 (54.4–67.8)	85.2 (80.1–90.2)	75.9 (69.5–82.3)	42.5 (34.8–50.2)	5.9 (3.3–8.5)	0.6 (0.3–1.5)	Reference
24–35	288	78.3 (72.6–84.0)	58.6 (52.1–65.2)	85.9 (80.3–91.6)	80.3 (73.5–87.2)	41.6 (32.5–50.7)	6.2 (2.6–9.9)	0.7 (0.3–1.5)	Reference
36–47	284	82.3 (76.2–88.4)	59.0 (50.4–67.7)	85.5 (79.9–91.1)	79.4 (72.7–86.1)	42.6 (34.8–50.5)	3.9 (1.3–6.4)	0.7 (0.3–1.7)	Reference

Characteristics	n	Offering Foods With Many Different Tastes and Textures	Not Forcing a Child to Finish Food or Bottles, Even if Not Interested or Didn't Have Much	Offering a Variety of Fruits and Vegetables	Limiting Foods and Drinks With Added Sugar (eg, Candy, Cookies, Soda, Juice)	Limiting Eating Meals in Front of Television or Other Electronic Devices	None of These Topics
		Reference	Reference	Reference	Reference	Reference	Reference
48-71	247	73.7 (65.5-81.9)	62.1 (53.7-70.4)	86.3 (80.4-92.2)	81.8 (73.8-89.7)	47.2 (37.8-56.7)	8.9 (3.4-14.4)
Weighted % (95% CI)							

^aOR indicates adjusted odds ratio; CI, confidence interval; FPL, federal poverty level.

^dDenominator includes mothers reporting information about their youngest child aged 6 mo to 5 y who lives with them

^baOR: odds of mother recalling this feeding topic after adjusting for all other sociodemographic variables in this table

^cVariable reflects information captured at the time of interview

* Statistical significance based on 95% CI; calculated using multivariable logistic regression after adjusting for all covariates included in this table.