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Nutrition Knowledge, Attitudes, and Fruit and Vegetable Intake as Predictors of Head Start Teachers' Classroom Mealtime Behaviors

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INTRODUCTION

Childhood obesity is a serious public health problem with approximately 14% of preschool aged children in the U.S. considered to be obese.[1] Given that children are spending an increasing amount of time in child care, with 61% of preschoolers in center-based care, child care teachers play an important role in influencing the diets of children, primarily through their mealtime interactions.[2-6] Although teacher nutrition knowledge and attitudes are thought to influence their mealtime behaviors with children,[7,8] evidence is still lacking. Similarly, it is unclear if child care teachers' own dietary behaviors influence their mealtime behaviors with children.[9,10] Given that children who are in center-based care consume up to 75% of their daily meals in the child care setting, there is a need to further understand teacher nutrition knowledge, attitudes, dietary behaviors and their classroom mealtime behaviors in order to inform future interventions.

A number of mealtime behaviors, including feeding practices, have been associated with better health outcomes in children.[11-15] Controlling feeding practices, for example, exerting pressure to eat, restricting foods and using food as a reward have been associated with less optimal outcomes, such as lower intake of vegetables and increased intake of unhealthy "off-limits" foods, even when not hungry.[16-22] In contrast, optimal behaviors are those considered more responsive and positive[23] (e.g., responding to children's signals of hunger and satiety, responding positively to children's attempts to self-feed), where caregivers allow children to control the amount of food they eat. These aforementioned practices have been associated with improved ability to self-regulate energy intake.[24] Although there are a growing number of studies exploring the mealtime behaviors and feeding practices of child care teachers,[10,25] most of the

literature has focused primarily on parents. While parents and teachers vary when it comes to the role they play in influencing children's eating,[26,27] the parent feeding literature provides an important foundation for examining the feeding practices of child care teachers.

Some studies that have included child care teacher feeding practices have explored how practices vary among teachers. For example, teachers with more education and experience engaged in more optimal mealtime behaviors[7] (e.g., sitting with children during the meal, consuming the same foods as children). The association between teachers' own nutritional knowledge and attitudes in relation to their mealtime behavior with children, above and beyond teachers' general education and experience, is less well understood, and findings are mixed. One study reported a positive association between mealtime behavior of teachers and nutrition knowledge and attitudes,[7] while others reported no demonstrable effect of improved nutrition knowledge on teacher behavior.[28] A better understanding of how nutrition knowledge and attitudes influence teacher behavior, however, has important implications for teaching education. Research examining nutrition attitudes and perceptions among Head Start teachers revealed common beliefs that children's eating behaviors and weight status were not connected and skepticism regarding the definition of overweight.[29] Additional research has also revealed nutrition knowledge to be low among child care providers.[9] A recent study examining Head Start teachers found that 97% of teachers could only answer 3 or fewer of 5 nutrition questions correctly. Furthermore, 24% of Head Start directors felt that lack of knowledge among teachers about how to encourage healthy eating was an important impediment to obesity prevention.[30] Learning more about teacher nutrition knowledge and attitudes may help improve teacher classroom mealtime interactions with children.

The study of teacher knowledge and attitudes as an influence on their own health promoting behaviors, and ultimately on children's behaviors, is supported by a number of theories including Bronfenbrenner's ecological model,[31] Bandura's Social Cognitive Theory,[32] and the Health Belief Model.[33] Both Bronfenbrenners' and Banduras' theories emphasize that important adults in a child's life, including teachers, influence behavior through several mechanisms including education, normative practices, and social support. Role-modeling may also be a factor in health promoting behavior. There is some limited research to show that more positive health characteristics and behaviors in one's own life may translate to efforts to improve other's health habits. For example, lower body mass index (BMI) among doctors is associated with more frequent discussions about weight loss with patients, compared to those with higher BMI's.[34] The behaviors of Women, Infants and Children (WIC) staff were also examined in the context of obesity prevention. Compared to a control group, staff members who received an intervention to make healthier food choices and be more physically active were more likely to report making positive changes in counseling WIC parents about their children's weight.[35]

Head Start has been a pioneer in setting policies related to food and nutrition for their students. For example, Head Start programs are required by Federal Program Performance Standards to provide nutrition training to staff as well as families.[36] Research indicates high levels of adherence when it comes to centers carrying out these trainings, with 92% of programs teaching staff routines pertinent to feeding children and 84% offering workshops for parents for preparing and buying healthy foods.[37] Some research suggests, however, that Head Start teachers have poor overall health and diets. For example, a study looking at 173 Head Start teachers in Texas found low fruit and vegetable consumption, high consumption of fast foods and sugar sweetened beverages, and self-reported poor nutritional health for teachers as a whole.[9]

Additionally, high rates of overweight and obesity have been reported among Head Start teachers across studies.[9,10] As compared to women with similar socio-demographic backgrounds, Head Start teachers were found to have poorer physical and mental health and higher rates of obesity, diabetes, and high blood pressure.[38] Examining teacher's diets in relation to their behaviors with children is an important avenue of study. Children of low socio-economic status are particularly at risk for consuming unhealthy foods and obesity,[39] therefore, understanding factors within their environments could have important implications for obesity preventions.

The purpose of this study was to examine the association between nutrition knowledge, attitudes, and fruit and vegetable intake among Head Start teachers and their mealtime behaviors (self-report and observed) in the classroom with children. Higher nutrition knowledge, more positive nutrition attitude scores, and higher fruit and vegetable consumption were expected to be associated with higher mealtime behavior scores in the classroom with children. Head Start centers were selected to represent a homogenous set of child care settings, in order to minimize center level differences in examining associations.

METHODS

Study Design, Participants and Recruitment

The study was a cross-sectional design collecting both survey and observational data between September 2014 and May 2015 in 16 Head Start centers across Rhode Island. The study was approved by the Institutional Review Board (IRB) at the University of Rhode Island in September of 2014.

Participants were a convenience sample of 85 Head Start teachers (i.e., head, assistant, special education and teacher's aides). Teachers were recruited with the assistance of the Rhode

Island Department of Education Child and Adult Care Food Program (CACFP) director and initial contact was made to the 7 Head Start Directors in the state. Six of the 7 directors responsible for 22 of the 32 Head Start centers across the state agreed to participate in the study and alerted teachers in their centers about the study. Teachers were instructed to contact the researcher and those teachers who agreed to participate scheduled a classroom visit where consent was signed prior to the meal observation. Participants were assured both anonymity and confidentiality in their responses both verbally and in writing (informed consent). Researchers recruited other classroom teachers during these on-site visits. A total of 86 teachers were in contact with the researcher, either through phone/email (19%) or in-person (81%), and 85 teachers enrolled in the study. One person declined to participate.

Procedures

Classroom observations occurred during 66 lunchtime meals (78% of meals observed) and 19 breakfasts (22% of meals observed). Consistent with Head Start meal patterns, breakfast typically included 1 fruit/1 vegetable (or 2 fruit or 2 vegetable servings), 1 bread/grain and 1 milk serving, while lunch, included all of the above, in addition to a serving of protein.[40] Researchers coded teachers on 42 mealtime behaviors (e.g., whether teacher ate same foods as child, whether teacher talked with the children about the foods they were eating). Researchers also collected data on the administration of the meal (e.g., what time meal started/ended, how foods were served). Observations were performed at a removed distance from the table and researchers did not interact with the children. Following the observation, teachers completed a self-administered survey at their convenience and returned it to the researcher at the next visit or by mail. Upon completion of the study (classroom observations and surveys), participants were given a $35 gift card.

Measures

Nutrition knowledge. A 12-item multiple choice nutrition knowledge questionnaire was developed for use in this study. Two faculty members, one each in Nutrition and Psychology, evaluated the measure for content validity by examining whether items were in line with current United States Department of Agriculture[41] (USDA) recommendations. The measure was then pre-tested with graduate students in Nutrition and Psychology, further modified based on this pre-test, and subsequently piloted with 5 Head Start teachers. Participants were asked to select the correct answer to questions about basic healthy eating and nutrition principles in line with current dietary guidelines suggested by the USDA (e.g., How many cups of vegetables should a moderately active adult eat per day? Which behavior specific message supports a healthy diet?). Each correct answer received 1 point and scores were summed, yielding a total score ranging from 0 – 12 (alpha=0.62). Higher scores indicated higher levels of nutrition knowledge.

Nutrition attitudes. Nutrition attitudes were assessed using the Nutrition Attitudes Inventory,[7] a 27-item self-report tool addressing attitudes about fostering healthy eating habits in early childhood (e.g., mealtime should be used as an opportunity to educate children, teachers should not force children to eat foods). The measure was originally pre-tested with registered dietitians and faculty in child development and early childhood education in a past validation study. The measure was found to have an internal consistency of 0.69 (alpha) in a previous study.[7] Participants were asked to respond to statements on a 3-point scale (Disagree=1; No Opinion=2; Agree =3). Scores were summed (range: 27-81) with higher scores indicating high agreement with attitudes that have been identified as important in supporting children's healthy eating. In the current study, the internal consistency of the measure was 0.62 (alpha).

Fruit and vegetable intake. Fruit and vegetable intake was assessed using The National Cancer Institute (NCI) Fruit and Vegetable Screener (FVS) (By-Meal).[42] The FVS is a 14-item tool that assesses daily consumption of fruits and vegetables in cups. The recommended minimum of cups of fruits and vegetables per day for adult women is 3.5 (variation is based on age, sex and level of physical activity) (USDA, 2014).[41] In a past validation study, fruit and vegetable intake using the FVS was found to have comparable (convergent) validity with fruit and vegetable intake on both the 24-hour recall (r=0.67) and the Food Frequency Questionnaire (FFQ) (r=0.68).[43] The measure was also found to have adequate internal consistency in the current study (alpha=0.74).

Mealtime behavior observation. Mealtime behaviors were assessed using a modified version of the Eating Occasions-Staff Behaviors Scale, one of 16 scales from The Environment and Policy Assessment and Observation (EPAO).[44] The EPAO is a 75-item scale designed to assess the nutrition and physical activity environment in child care settings. The instrument was originally validated in a child care environment where items were evaluated for both content and clarity, then subsequently revised. Inter-observer agreement of the Eating Occasions-Staff Behaviors Scale was estimated using intra-class correlation coefficient (ICC=0.78) in a previous study.[44] For the purposes of the current study, 9 original items from the Eating Occasions-Staff Behaviors Scale, plus an additional 38 items designed by the authors, comprised the 47-item EPAO-Expanded Feeding Practices (EPAO-EFP). The EPAO-EFP assessed the occurrence of 42 mealtime behaviors and included 5 additional questions about the administration of the meal (i.e., breakfast vs. lunch, what time meal started/ended, how long the meal lasted, what foods of a behavior (e.g., whether teacher ate same foods as child, whether teacher consumed sweet or salty snacks) and 27 items captured the frequency (Never=1; 1-2 times=2; 3 or more times=3) of behaviors (e.g., whether teacher talked with the children about the foods they were eating,

whether teachers rushed children to eat). Total scores were summed with higher scores indicating more optimal mealtime behaviors (e.g., enthusiastically role modeling healthy eating, responding to children's signals of hunger) (range: 42-111) (alpha=.70). Interrater reliability (Kappa=.83) was established between 2 observers (KH and MF) at the beginning of the study and confirmed (Kappa=.84) at a later point in the study. A Kappa value between 80-100% indicates an 'almost perfect' level of interrater reliability.[45]

Mealtime behavior self-report. The Teacher Reported-Feeding Practices (TR-Feeding Practices), is part of 1 of 3 surveys from the Environment and Policy Assessment and Observation Self-Report (EPAO-SR), an 800-item self-administered version of the EPAO (for both teachers and directors) assessing classroom behaviors.[46] The measure was originally validated by both child care experts and parents for content validity by examining relevance, format and clarity of items.[46] Reliability evidence was collected on individual staff feeding behavior items in a previous study. One and 4-day estimates ranged from 0.06 to 0.92, with most scores above 0.30. The TR-Feeding Practices contains 24 items that ask teachers to rate statements on a scale from 1 to 6 to the degree to which they engaged in certain behaviors (e.g., praise children when they try a new food, encourage children to eat a wide variety of foods) (Never=1 to Always=6) or agreed with certain behaviors (e.g., communicate the importance of healthy eating to parents, role mode healthy behaviors) (Strongly disagree=1 to Strongly agree=6). Scores are summed to produce a total score with higher scores indicating more optimal mealtime behavior (range: 24-144). In the current study, the internal consistency was 0.65 (alpha).

Demographics. Teachers completed a 24-item Demographics, Health and Center Practice survey developed for this study. The survey was created using pre-existing items from 2 validated

183 measures previously used with Head Start populations, the Head Start on Healthy Living Health
184 Behavior Survey and The Head Start Teacher Survey.[9,47] Variables used in this study include
185 teacher age, years as a child care teacher, years teaching at the current center, teacher role (i.e.,
186 head teacher, non-head teacher), education (i.e., less than college graduate, college graduate or
187 more) and nutrition training (i.e., less than 1 time a year, 1 time a year or more). These variables
188 were selected to be examined as covariates because they were found in past literature to be
189 related to mealtime behaviors with children.[7,48] Teacher age, years as a child care teacher, and
190 years working at the current center were highly correlated and combined into a composite
191 (alpha=0.81). This composite representing experience was used in all subsequent analyses.

192 **Data Analysis**

193 Descriptive measures of central tendency, variability, internal consistency (Cronbach's
194 alpha) and distributions were assessed for all variables. Analyses indicated that all items were
195 normally distributed except for nutrition attitudes. Although both square root and Log 10 were
196 initially conducted, transformations did not make the data more normally distributed. Regression
197 diagnostics were conducted to examine residuals. The P-P plot for the non-transformed attitude
198 variable was observed to follow a pattern of normal distribution. Bivariate analyses were
199 conducted for continuous variables (e.g., experience) and the independent (i.e., nutrition
200 knowledge, attitudes and fruit and vegetable intake) and dependent variables (i.e., observed and
201 self-reported mealtime behaviors) using Pearson correlations. Associations between categorical
202 covariates (education, teacher role and training variables) and the independent and dependent
203 variables were examined using ANOVA. Since the meal environments differed by time, bivariate
204 analyses were conducted between lunchtime and breakfast observations to examine significant
205 differences in observed behavior total scores. A hierarchichal multivariate regression analysis

was conducted on observed teacher mealtime behavior. To control for significant covariates, teacher experience followed by meal type was entered into the model in the first step. In the second step, nutrition knowledge, attitudes and fruit and vegetable intake (independent variables) were consecutively entered into the model (enter). A second hierarchichal multivariate regression analysis was conducted on self-reported teacher mealtime behavior. To control for significant covariates, teacher experience was entered into the model in the first step. In the second step, nutrition knowledge, attitudes and fruit and vegetable intake (independent variables) were consecutively entered into the model (enter). Associations between the observation and mealtime self-report were examined using Pearson correlations. The full reporting of these findings are the focus of a separate study, however, main findings are briefly included in the results.[49] All analyses were performed using SPSS software (SPSS 21.0).

RESULTS

Teachers were predominantly female (98%), and non-Hispanic white (84.6%). Half of teachers (50.6%) had a college education or more, while 44.7% had some college or technical school. Participants were experienced teachers with an average of 14 years of experience and more than 7 years teaching at their current center. The majority (57%) identified as either head teachers, or 37.6% as assistant teachers, 2.4% as special education teachers, and 2.4% as teacher's aides and most teachers worked full-time (83.5%). Two-thirds (68%) of respondents reported receiving nutrition training at least once a year. Mealtimes averaged 23 minutes.

In general, teachers' overall scores for most measures were high. Teachers demonstrated high levels of nutrition knowledge (M=9.80, SD=1.96, range=3.0-12.0), nutrition attitudes (Median=72.87, interquartile range (IQR)= 70-75, range=54-79), self-reported mealtime

behaviors (M=121.09, SD=8.72, range=97-141) and observed mealtime behaviors (M=91.93, SD=4.77, range=82-101). Mean fruit and vegetable intake was found to exceed the minimum recommendation of 3.5 cups per day (M=3.88, SD=1.82, range=0.9-10.7).

There was a positive association between teaching experience and both self-reported ($r(83)=.27$, $p<.05$) and observed ($r(83)=.39$, $p<.01$) mealtime behavior. Mealtime behaviors were not associated with teacher role, nutrition training or level of education (data not reported). Comparisons (t-tests) between breakfast and lunch observations indicate that teachers' overall scores were significantly higher during lunch (M=92.76, SD=4.69) than during breakfast (M=89, SD=3.9), $p<.01$.

For self-reported and observed meal time behavior, there were no associations between teacher nutrition knowledge, attitudes, and fruit and vegetable intake with one exception; there was a positive association between self-reported mealtime behavior and attitudes (Table 1). More positive attitudes were associated with higher self-reported mealtime behaviors.

Using hierarchical multivariate regression, observed teacher mealtime behavior was regressed on nutrition knowledge, attitudes, and fruit and vegetable intake yielding a significant model (Table 2) with meal type (lunch) and teacher experience associated with higher scores during observations (Model 1). However, after controlling for meal type and teacher experience, none of the independent variables were significantly associated with the overall observed behavior total score (Model 2).

In terms of self-reported mealtime behavior (Table 3), teacher experience significantly predicted teacher self-report (Model 1). After controlling for teacher experience, nutrition attitudes were significantly associated with the self-reported behavior total score (Model 2).

Higher scores on the nutrition attitude scale were associated with higher total scores on the teacher mealtime behavior self-report.

The analyses of the associations between the observation and mealtime self-report found no overall association between the observation and mealtime self-report. An item analysis yielding a more nuanced set of associations is reported elsewhere.[49]

DISCUSSION

The goal of this study was to examine the association between nutrition knowledge, attitudes and fruit and vegetable intake among Head Start teachers and their classroom mealtime behaviors with children. The study found that teacher nutrition knowledge, attitudes and fruit and vegetable intake were not related to observed behavior during mealtimes in the classroom. Nutrition attitudes were positively associated with teacher self-reported classroom mealtime behavior, however, only accounted for a small percentage of the variance in the model. Overall study findings showed that teacher mealtime behavior was significantly associated with teacher experience.

Direct observation has been considered the gold standard when attempting to measure behavior.[50] It is somewhat surprising, therefore, that the independent variables (i.e., nutrition knowledge, attitudes and fruit and vegetable intake) were not associated with observed interactions within the classroom. Even more intriguing was how teachers were often engaging in behaviors considered to be ‘best practices’ such as frequently engaging in talk with the children about the foods they were eating and eating fruits and vegetables during mealtimes with children.

Teachers demonstrated high levels of nutrition knowledge, positive nutrition attitudes, and reported better than average fruit and vegetable intake. Based on the Health Belief Model,[33] we expected these factors to be associated with more optimal classroom behaviors (e.g., talking with the children about the foods they were eating, enthusiastically role modeling healthy eating) and were surprised that they were not. One possible explanation for this lack of association may be related to how the behaviors with the observational tool are coded. For example, the coding choices for most behaviors were 'none', '1-2 times' or '3 or more times'. If a teacher praised a behavior 3 times, they were in the same category as a teacher who praised a behavior 10 times. Given that the teachers' overall results on the observations were high, it is possible that coding limitations may not have captured the degree of variability that actually exists. Also, teachers under observation may in fact respond with more optimal behaviors.[51]

Head Start is known for its strong nutrition guidelines and teacher training.[36, 52] Working in Head Start programs has been associated with practicing healthier feeding practices such as modeling healthy eating and teaching children about nutrition compared to other child care contexts.[47] Head Start providers are also more likely to use family style feeding, another recommended healthy feeding practice, at higher rates than CACFP and non-CACFP providers.[47] All Head Start programs are required by Federal Program Performance Standards to provide nutrition training for their staff [36] and research has shown that Head Start teaching training influences the quality of nutrition-focused instruction.[53] For this study, Head Start classrooms were originally selected to limit variability that might occur across centers in order to be able to capture individual teacher variability. Findings suggest that practices may be so uniformly accepted that despite individual teacher differences, teachers behave with great consistency. Head Start trainings seem to be working well and contributing to optimal mealtime behaviors.

Nutrition knowledge in this study refers to knowledge of basic healthy eating (e.g., How many cups of vegetables should a moderately active adult eat per day? What message supports a healthy diet?). Others have found that the experience, education, and positive nutrition attitudes of caregivers are associated with feeding behavior[7] and therefore it was expected that individual teacher nutrition knowledge would be associated with teacher classroom behavior. The lack of support for this finding suggests that although the Head Start teachers have basic healthy eating knowledge, their overall experience appears to be key to engaging in optimal mealtime behaviors.

It was hypothesized that higher fruit and vegetable intake among teachers would be associated with more optimal mealtime behaviors with children, possibly through modeling of healthy behaviors.[32] The lack of association between their own health behavior (fruit and vegetable intake) and mealtime behavior with children suggests that teacher fruit and vegetable intake may be independent from how teachers behave during meals once they are in the classroom. There may be several reasons for this. One explanation may be that meals are generally proscribed and teachers have little input into what foods are offered. Additionally, teacher's reporting of fruit and vegetable consumption was also higher than might have been expected. Others have reported poorer diets among Head Start teachers,[9] potentially suggesting a response bias, with teachers wanting to report healthier habits. For example, the measure for body weight (data not reported), a validated body size assessment scale, indicates that more than half of participants were overweight or obese, further raising the question as to whether fruit and vegetable intake was accurately reported. Some research has shown that those who are overweight/obese are more likely to report that their diets are healthier than they actually are.[54]

Teacher experience was found to be associated with both observed and self-reported mealtime behavior. Previous research has also found an association between experience and optimal mealtime behaviors.[7] It is likely that older, more experienced teachers have had more exposure to curriculum involving nutrition, contributing to more expertise and confidence in working with children. Head Start teachers in this study, on average, had worked in Head Start centers for more than a decade demonstrating low turnover, also potentially benefitting the children in their care.

An important strength of this study is the utilization of a direct observation to gather mealtime behavior data. In addition, the study enrolled approximately 1/3 of Head Start teachers in the state. The study is not without limitations, however. For one, many of the constructs of interest did not have well-developed measures. For example, the authors were unable to identify a nutrition knowledge measure that captured basic principles of healthy eating. Some measures required highly specific knowledge (e.g., role of particular nutrients),[7] while others required ratings of 'healthy' with little consensus around the correct answers.[47] Still others were developed outside of the United States and deemed culturally unsuitable for U.S. populations.[55] As a result, the authors adapted existing measures or developed their own. This creates limitations (i.e., measures not validated elsewhere), however, given the dearth of existing measures, moves the study of these constructs forward, despite the limitations. In addition, internal consistency scores for measures were also somewhat low. Furthermore, a fruit and vegetable screener was used to represent dietary intake. Other dietary measures were considered (e.g., Healthy Eating Index, Food Frequency Questionnaire) but excluded due to participant burden. While others have used the FVS in the past and there is high convergent validity between the FVS and dietary recall, the measure does not capture the full range of dietary intake.

In terms of mealtime behaviors, there were also limited tools available for observing preschool classrooms. For the purposes of this study, the authors adapted an existing observation measure. The original instrument included 9 items to assess staff feeding behaviors; the final version included 47 items capturing a much wider range of behaviors (e.g., reasoning, negotiation, support of self-regulation). The coding structure of the original measure (which was adapted in this study), however, had a limited range for coding frequency of behaviors which may have contributed to weaker than expected associations. Also, in general, observations conducted only at one point in time may not have captured overall behavior.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The results of this study have important implications for child care contexts. As has been established in the literature, optimal mealtime behavior among teachers is significantly associated with more teacher experience.[7] While retaining preschool teachers is a challenge that extends well beyond the focus of this study (e.g., pay, benefits), consideration of the associations between teacher mealtime behavior and their experience may provide an avenue for enhancing teacher retention. Additionally, the focus on Head Start specifically was intended to reduce variability across types of centers to be able to focus more closely on individual level variables of teachers. Given the fairly high degree of consistency and behaviors across teachers, one question that emerges is whether this is unique to Head Start programs. One possibility, not examined here, is that Head Start mealtime guidelines may be enforced to such a degree that individual variability in teacher behavior is reduced. The existence of nutrition policies within a child care context has been found to be associated with promoting healthy mealtime behaviors,

as compared to programs that did not have any mealtime policies.[8] Future research would benefit from a more systematic examination of this hypothesis.

Based on study findings and limitations, recommendations for future studies include measuring the knowledge of procedural practices/adherence to specific Head Start mealtime guidelines in association with mealtime behaviors; replicating this study in child care teacher populations that operate under different conditions (e.g., food availability); developing more suitable measures for the field (e.g., nutrition knowledge, mealtime behavior); collecting data on all aspects of diet, not just fruit and vegetable consumption; observing breakfast only or lunch only or including designs with samples large enough to control for different mealtime settings; examining whether childcare provider variables (e.g., knowledge, attitudes) relate to child outcomes (e.g., child fruit and vegetable intake); and conducting several consecutive observations on the same teacher as multiple observations over several days would likely yield more reliable data.[56]

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