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Nutrition, Physical Activity, and Screen Time -related Attitudes and
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APPROVAL PAGE

Master of Arts Thesis

Nutrition, Physical Activity, and Screen Time -related Attitudes and Perceived Barriers of Family Childcare Providers and Differences by Ethnicity

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Abstract

Background: Childcare settings play an important role in shaping young children's eating, physical activity (PA), and screen time (ST) behaviors. However, little research has focused on family childcare homes (FCCHs). This paper examines family child care provider (FCCP)-reported attitudes and perceived barriers related to nutrition, PA, and ST of preschool aged children in their FCCH, exploring differences by provider ethnicity.

Methods: We used baseline data from an ongoing cluster-randomized trial including surveys with FCCPs. We examined demographic characteristics and provider-reported nutrition, PA, and ST-related attitudes and barriers. Differences by ethnicity were assessed using chi square and multivariate loglinear analysis adjusting for provider education.

Results: FCCPs from Rhode Island and Massachusetts completed a telephone survey ($n=168$, 100% female and 72% Hispanic) and in person survey ($n=127$). The attitudes of many FCCPs were consistent with national guidelines for obesity prevention in early child care. Adjusting for education, there were statistically significant differences in some attitudes by ethnicity. Hispanic FCCPs were less likely than non-Hispanic FCCPs to agree with statements related to the ease of healthful dietary practices such as children's water, juice and milk intake, serving whole grains, and knowing how to help children be more physically active. Hispanic FCCPs were more likely than non-Hispanic FCCPs to agree with the importance of sitting with and eating the same foods as the children, joining with children in play, and leading PA lessons.

Conclusions: While many FCCP hold some nutrition, PA, and ST-related attitudes consistent with national guidelines, improvement is needed to ensure that all providers engage in positive

practices and achieve better nutrition, PA and ST-related environments in FCCHs. There is also a need for culturally relevant trainings for FCCPs.

Keywords: nutrition, physical activity, screen time, obesity prevention, child care, early care and education, family child care homes, providers

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INTRODUCTION

Background

Childhood obesity has dramatically increased among all age groups since 1988.¹ Data from 2015-2016 showed that 13.9% of preschool-aged children (2-5 years) are obese.² Children of low-income, racial/ethnic minority families are at a particularly high risk of overweight and obesity³⁻⁶ including higher overweight and obesity prevalence in Black and Hispanic than White children.⁷ Childhood obesity is a serious and urgent public health problem⁸⁻¹¹ that has substantial consequences for the physical and mental health of children,^{9,12-16} and is also associated with long-term adverse health outcomes and greater likelihood of obesity later in life.¹⁷

Early childhood is a critical time for developing eating patterns and food preferences¹⁸⁻²⁰ and other health-related behaviors, including physical activity (PA) and screen time (ST), and these behaviors may persist into adulthood.²¹ Thus, it is critical to understand early risk factors such as unhealthy diet, PA and ST.²²⁻²⁴ Evidence has shown that current dietary behaviors and PA of preschoolers do not meet national guidelines, especially those from low-income and ethnic minority families.^{21,25-29}

Nutrition. Poor diet is one of the major contributors to the obesity epidemic.^{30,31} The 2015-2020 Dietary Guidelines for Americans aged 2 years or older make following five recommendations including a variety of fruits and vegetables, whole grains, fat-free and low-fat dairy products, a variety of protein foods and oils.³² Children should be able to access and consume such healthful foods, adequate portion sizes, and limit intake of fats and added sugars.³³ Unfortunately, most preschool-aged children's diets do not follow these guidelines.^{25,26,28,34} For

example, they have relatively high consumption of sugar-sweetened beverages and low intake of vegetables^{35,34,36} In addition, diets of low income and ethnic minority children are even further from guidelines.^{34,36}

Feeding practices of adult caregivers can have a strong impact on the dietary intake of preschool children. Infants and toddlers have an innate ability to regulate their energy intake and this ability can continue throughout early childhood.^{37,38} Self-regulation of eating, which refers to the ability to recognize internal feelings of hunger and fullness³⁹ and eat accordingly, is related to childhood weight status.⁴⁰⁻⁴³ Responsive feeding practices which are responsive to children's cues of hunger and fullness can support children's self-regulation of eating.³⁹ However, child care providers often use feeding practices that can compromise children's self-regulatory abilities and these practices have been associated with obesity.^{39,44} For example, controlling or restricting feeding practices are related to increased food refusal, which can disrupt children's self-regulation of eating.⁴⁵ Other feeding practices such as giving food rewards for good behavior and asking children to clean their plates can also disrupt self-regulation of eating.^{38,39}

Physical Activity. PA is also crucial to overall health and to obesity prevention.³³ The Physical Activity Guidelines for Americans 2nd edition recommend that preschool-aged children should be physically active throughout the day to enhance growth and development.⁴⁶ In addition, adult caregivers of preschoolers should encourage active play that includes a variety of activity types for approximately 3 hours per day".⁴⁶ However, many children under age 5 fail to meet the CDC physical guidelines of at least 60 minutes of moderate to vigorous activity per day⁴⁷, with spending over 30% of their time awake in sedentary activity⁴⁸ In addition, children from low-income and minority families are being more sedentary compared to relatively high-income and White families.^{49,50}

Screen Time. Several studies have revealed a dose-response relationship between obesity prevalence and ST in young children,^{21,24,51,52} especially among infants and toddlers.⁵³ Children who watch commercial TV are exposed to more food and beverage advertisements,⁵⁴ which may increase obesity risk.^{55,56} According to ST Guidelines released by American Academy of Pediatrics (AAP), children under 18 months are recommended to get no screen time. Kids between 2 and 5 should have no more than one hour of screen time a day.⁵⁷ However, according to the newly-released Common Sense Media report, US children under age 2 spend about 42 minutes, and children ages 2 to 4 spend 2 hours and 40 minutes with screen media daily, with children from low-income and minority families having significantly more screen time.^{50,58}

Importance of child care settings: Although parents play an important role in shaping children's eating behaviors, PA and ST, research suggests that childcare settings also play a critical role in shaping children's dietary behaviors, PA and ST.^{21,59,60} Approximately 80% of preschool-aged children with working parents are in some form of childcare,⁶¹⁻⁶³ where they spend on average 22.5 hours per week.^{64,65} Preschoolers in child care may consume more than half (50-70 %) of their daily food intake in this setting.⁶⁶⁻⁶⁸ Recent research suggests that child care providers may be more influential than, or equally as important as, parents in shaping food preferences, PA and ST of young children.^{61,69,70}

In 2002, a team of childhood obesity prevention researchers at UNC Chapel Hill created the Nutrition and Physical Activity Assessment for Child Care (NAP SACC).⁷¹ Key stakeholders such as child care providers, technical assistance consultants, early care and education professionals, and parents guided NAPSACC's development.⁷¹ Their input along with current research and national health recommendations were the basis for the establishment of NAP SACC best practices - the most important actions child care programs can take to shape

children's healthy eating and physical activity habits.⁷¹ The validated NAP SACC tool,⁷¹ recommends that child care providers should follow evidence-based nutrition, PA and ST best practices in the following areas: mealtime environment, feeding practices, role modeling, encouragement, parent communication, nutrition education, PA, sedentary time, screen time, PA education and policies.⁷¹ Several studies have found that child centers improved their healthy eating and PA practices, policies, and environments after using NAP SACC.⁷²⁻⁷⁷

Studies have shown the important influence that childcare providers' have on children's food intake.^{60,66,78,79} A review paper assessing nutrition in child-care settings suggested a need to improve the nutritional quality of food provided to children.⁶⁶ Research has also indicated that childcare settings play an important role in PA behavior of children while in care,⁸⁰⁻⁸³ suggesting that children in centers with supportive environments achieved more moderate-to-vigorous PA and less time in sedentary activities.⁸⁰ As for ST, preschool aged children in a nationally representative sample were found to be exposed to about 4 hours of screen time on weekdays.⁸⁴ Children in centers had the lowest screen time (3.2 hours) compared to those in parental care only (4.4 hours), home-based care (5.5 hours), and Head Start (4.2 hours).⁸⁴ Thus, interventions to improve the nutrition, PA and ST environments in childcare settings are greatly needed.^{61,66,85,86}

Most obesity prevention research has been conducted in childcare centers, with much less research occurring in family child care homes (FCCHs), the second-most utilized non-relative child care settings, which care for 1.6 million US children.^{87,88} FCCHs provide care in a professional caregiver's home, rather than the institutional setting of center-based child care. FCCHs typically have one caregiver who cares for approximately six children.⁸⁹ Low income and ethnic minority families (i.e. Latinos) may prefer FCCHs to other child care settings due to

cultural preferences for family-like care, flexible hours and lower costs.⁹⁰ However, there is evidence that children enrolled in FCCHs may be more likely to be overweight or obese than children in center-based care.^{70,91} The research to date in FCCH is described below.

FCCH Environment

Policy Environment. Research comparing center-based child care with FCCHs^{70,86,92,93} has found that fewer FCCHs had comprehensive written nutrition and PA policies regarding best practices related to beverages, the use of food as reward or punishment, encouragement for consumption of healthy foods,⁸⁶ foods purchased for celebratory events,⁹² and PA policies.^{70,92,93}

The Child and Adult Care Food Program (CACFP) is a federally regulated program that provides funds to support the reimbursement of child care programs, including FCCHs, providing nutritious meals and snacks to lower-income children.⁹⁴ Most studies examining the nutrition environment of child care facilities that participate in CACFP were conducted in center-based child care settings,^{93,95–97} and little is known about what occurs in FCCH. A recent study compared CACFP versus non-CACFP participating FCCHs in Mississippi in terms of the food and beverages provided and the nutrition practices and policies. They found that a greater proportion of the CACFP-participating homes offered healthful beverage selections compared with non-CACFP homes.⁹⁸ Another study examined the differences in the food environment by CACFP status and found that non-CAFCP FCCH served candy and sweetened beverages significantly more often than CACFP homes.⁹⁹ This finding is consistent with a study that showed that CACFP providers engaged in more best nutrition practices compared to non-CACFP providers.¹⁰⁰ Another study employed a cross-sectional design to investigate the implementation of the beverage policies in both child care centers and FCCH in Georgia by CACFP participation and showed that compared to non-CACFP programs, childcare settings with CACFP programs

were less likely to serve SSBs and more likely to serve low-fat or fat-free milk to 2-5-year-olds type.¹⁰¹

A recent evaluation examined the impact of a policy-focused intervention by a child care resource and referral agency on FCCH nutrition-related policies and practices and child dietary intake.¹⁰² They found the policy initiative, which included staff workshops, materials, site visits, and technical assistance regarding development and implementation of nutrition policies, was successful at reinforcing and improving upon nutrition-related practices in FCCH.¹⁰² Therefore, it appears that stronger policies are needed in FCCH, which may play an important role in strengthening FCCH nutrition environments.

Food Environment

Studies assessing foods served in FCCHs have found that a significant proportion of family child care providers (FCCPs) offer less-healthy foods and beverages (e.g., fried potatoes and whole milk) than center-based child care settings.^{70,93,97} Research assessing feeding practices in FCCHs found that though most providers reported either meeting or exceeding child care standards related to serving adequate fruit and vegetables and infrequently serving fried foods or unhealthy snack foods, infrequent servings of low-fat milk and frequent use of unhealthy foods for celebration were still areas of concern.⁹² However, our previous study assessed whether observed nutrition-related practices met NAP SACC guidelines and found though many of providers reported implementing positive nutrition related practices, the observational data indicated that a large proportion of providers did not meet NAP SACC nutrition guidelines.¹⁰³ We found many providers didn't meet the guidelines for serving children enough vegetables and whole grains, making drinking water always available, and limiting snacks.¹⁰³ In addition, Tovar et al. (2018) conducted a cross-sectional analysis to describe the nutritional quality of food

served to children in FCCHs and to assess the extent to which children ate what was served. They found that there was room for improvement with regards to vegetables, grains, seafood and plant protein, fatty acids, and sodium.¹⁰⁴ A study examined the association between the nutrition environments of FCCHs and child's diet quality and found that higher scores on the Environment and Policy Evaluation and Observation (EPAO) sub-scales for foods provided, nutrition education, and nutrition policy were all associated with greater child dietary quality score.¹⁰⁵

There is limited research focusing on how FCCPs' feeding practices influence the diet and eating habits of young children in their care. One observational study showed that FCCPs frequently praised the children for trying new foods and healthy foods,¹⁰⁶ and another study found that FCCPs used both best practices and coercive controlling practices in response to children's verbal and nonverbal refusals or acceptance of food.⁷⁰ Tovar et al. (2018) described how the EPAO was modified to add provider feeding practices and found that FCCPs used a myriad of feeding practices while interacting with children during meal and snacks, and providers' use of autonomy support practices such as letting children decide the amount of food they want to eat were associated with higher diet quality in children.¹⁰⁷ Future interventions aimed at increasing providers' use of autonomy support practices may be a promising strategy for encouraging healthier eating habits in young children since controlling and restrictive feeding practices tend to be associated with overeating and poorer self-regulation of energy intake in preschool-age children.^{103,108,109}

Physical Activity and Screen-time Environment. Research with FCCHs found that many provided less than the recommended 90 to 120 minutes of daily active play and more than the 30 minute weekly limit on-screen activities.^{51,52,110,111} For example, accelerometer data from Delaney et al. (2014)'s study showed that the mean minutes of sedentary PA per hour of children

was 34.3, moderate-to-vigorous PA was 8.8, and vigorous PA was 3.1 minutes.

⁵²In addition, a study explored nutrition and PA policies and practices in FCCH found that many providers reported that they restricted PA for children who misbehave and that children in their care had widespread use of TV and video games throughout the day.⁹² A study conducted in North Carolina FCCHs assessed children's PA and sedentary behavior, as well as the characteristics of the FCCH PA environment found that FCCHs had worse PA practices than center-based child care¹¹² and suggested that the differences may be due to PA resources and practice differences within the sites instead of the neighborhoods.¹¹³ This study highlighted the need to improve FCCHs and increase children's behaviors by providing adequate time and outdoor play spaces.¹¹²

Parents and FCCPs' Communication. Though there is limited research examining the role of inconsistency between parents' and child-care providers' practices,⁷⁸ some studies have suggested that inconsistencies between parents and FCCP with regard to parenting practices are associated with undesirable outcomes.^{114,115} One recent study examined the role of inconsistency between parents' and child-care workers' practices and found the existence of inconsistencies in nutrition- and PA-related practices between child-care and home.⁷⁸ And, these inconsistencies seem to be associated with unhealthy behavior in children such as lower water intake, higher biscuit and cake intake, higher sugary beverage intake, and lower activity levels.⁷⁸ However, to the authors' knowledge, no research was done in FCCH. Therefore, addressing home-FCCH mesosystem inconsistency is important in future obesity research among FCCHs. A recent literature review suggested that providers' attitudes and beliefs influence their family communication practices.⁷⁰ Therefore, training staff at FCCPs is warranted to eliminate misconceptions and inappropriate beliefs about nutrition and PA practices, enhance self-efficacy,

and support communication with families concerning children's eating behaviors and physical activity.

Neighborhood Differences. FCCH nutritional practices may be related to neighborhood conditions such as food availability. Natale and colleagues (2014) found that nutrition-related FCCH/center differences including delivery of cooking lessons, provision of fresh fruit, and use of high-fructose sweeteners were eliminated after neighborhood adjustment.¹¹³ and that the differences appeared to be moderated by neighborhood socioeconomic status, which indicated that poverty levels and the impact on health disparities are still the concerns in childcare settings. Kao et al. conducted a multicomponent obesity prevention intervention among FCCHs in Northern California, which focused on delivering a PA workshop for child care staff and technical assistance to develop a policy to promote PA and other healthy behaviors.¹¹⁶ They found that successful implementation of the intervention likely contributed to the implementation of providers' practices that increased PA opportunities including increasing the number of structured, adult-led activities and the number of structured, adult-led minutes of PA, improving ST practices and the PA environment..¹¹⁶

In conclusion, this review highlights that there is room for improvement in FCCH nutrition and PA environments as they likely affect children's dietary, PA and ST behaviors. A recent literature review suggested that providers' attitudes and beliefs influence their feeding and PA practices as well as family communication practices⁷⁰. But few studies have examined the provider nutrition and PA attitudes and beliefs of FCCP. Moreover, no studies have examined ethnic differences on nutrition and PA attitudes and beliefs of FCCP even though there are clear ethnic disparities seen in childhood obesity³⁻⁶ as well as qualitative data indicating potential differences in nutrition and PA-related attitudes by childcare provider ethnicity.¹⁰⁶

Purpose of the Present Research

The purpose of this paper is to examine FCCP reported attitudes and perceived barriers related to nutrition, and PA and ST practices in their FCCH overall and between Hispanic and non-Hispanic providers. We hypothesize we hypothesize that ethnic differences will be seen in providers' reported nutrition, PA, and ST-related attitudes and perceived barriers.

METHODS

The current study utilized baseline data from an ongoing cluster randomized trial, Healthy Start/Comienzos Sanos that is evaluating the efficacy of a multicomponent intervention to improve the food and PA environments of FCCHs, as well as the diet, PA, and ST behaviors of the 2-to-5-year-old children in their care.⁵⁵ Details about study recruitment, intervention and evaluation were discussed elsewhere,¹¹⁷ but methods relevant to the current analyses are described below. In the first year of the project, 7 focus groups were held with 45 FCCPs to inform the development of the Healthy Start intervention and evaluation measures.^{109,117} Cognitive assessment testing was also conducted with the target audience prior to the finalization of the study questionnaires.

To be eligible for the intervention trial, participants had to operate an FCCH within 60 miles of Providence, be in operation for at least 6 months with plans to remain in operation for at least 1 year, and not close for more than four weeks during the year. The provider had to read and speak Spanish or English, and care for at least one child between the ages of 2-5 years old for at least 10 hours per week who ate at least one meal and snack a day at the FCCH. Eligible providers completed a 30-minute baseline telephone survey followed by a 30-minute in-person survey at the FCCH. Once at least one parent of an eligible 2-to-5-year-old child cared for in the FCCH consented for their child's participation, a two-day observation and measurement session

was scheduled. This session included child height and weight measurement, child accelerometry measurement, an observation of food consumed by children and an observation of the FCCH environment including food and PA environment, foods and beverage served and PA and ST opportunities offered using the validated EPAO. All measures were administered by trained project staff. Participants received \$25 for completing the baseline in-person survey and \$50 for the two-day observation. Baseline data collection was conducted from November 2015 until July 2018.

Measures relevant to the current analysis

Demographics and other provider characteristics. Providers' gender, ethnicity, and race were assessed on the telephone survey and the following variables were assessed on the in-person survey: age, household income, marital status, education, years in the U.S., country of origin, years as a childcare professional, number of children currently in their care (and how many are their own children or grandchildren), and whether the FCCH accepts Child and Adult Care Food Program (CACFP) benefits. See Table 1.

Attitudes and perceived barriers. The phone survey included 13 questions to assess provider attitudes about nutrition, PA, and ST in the child care setting. Providers were asked to express their level of agreement on a 5-point scale (agree a lot, agree a little, neither agree nor disagree, disagree a little, disagree a lot) with a series of statements modified from the Child Care Provider Healthy Eating and Activity Survey,¹¹⁸ our own statewide survey of child care providers,¹¹⁹ and themes that emerged from our focus groups.¹⁰⁹

The in-person survey included an additional 32 questions asking about provider attitudes and perceived barriers about nutrition, PA, and screen-time in the child care setting. The items were presented as statements with which the FCCPs expressed their level of agreement (agree a

lot, agree a little, neither agree nor disagree, disagree a little, disagree a lot). These items were derived from previous research projects,^{120,121} a review of relevant literature, and issues identified during our focus groups.¹⁰⁹ Examples of attitude questions included “You have enough time to sit at the table with the children at meal and snack times” and “You have enough time to help the children be physically active”. Examples of perceived barrier questions included “You are concerned about wasting food because the children won’t eat healthy foods.” And “You worry about children’s safety when they play outside”. See Table 2 for nutrition-related attitudes and perceived barriers and Table 3 for PA and ST related attitudes and perceived barriers.

Statistical Analysis

We used two different baseline data sources from the trial, thus, the sample size differs for some variables as not all providers that completed the baseline telephone survey (n=168) went on to complete the in-person survey (n=126). We examined the frequency of provider-reported attitudes and perceived barriers and then examined associations by ethnicity (Hispanic vs. Non-Hispanic). Chi-square and ANOVA were used to test if demographics differed by ethnicity. We used Chi-square or Fisher’s exact test to assess ethnic differences in provider-reported attitudes, and perceived barriers. We also performed a multivariate log-linear analysis to create a custom (nonhierarchical) model for the associations between ethnicity and provider-reported attitudes and perceived barriers, adjusting for FCCP education. We ran all analysis using SPSS version 24.¹²² The Institutional Review Boards of Brown University and the University of Connecticut approved all study procedures and materials.

Results

The demographic characteristics of the providers are presented in Table 1. Providers were all female, 72% Hispanic, and 72.2% were married or living with a partner. They were on

average 48.8 years old and 82% participated in CACFP (Table 1). About a third (36%) cared for their own children or grandchildren in their FCCH. These characteristics did not differ by ethnicity. Overall, 14 % of providers were Black. A total of 11% of providers had no high school education and 18% had Bachelor's degrees or higher. Lower-income providers (<\$25K) represented 14% of the sample. Providers had an average of 7.5 children in their care, and worked in the early childcare profession for 12.7 years. Overall, compared to non-Hispanic providers, Hispanic providers were more likely to identify as Black ($p < 0.001$); had lower education levels ($p = 0.02$); reported lower income ($p < 0.001$); lived in the US for fewer years ($p = 0.02$); had fewer children in their care ($p = 0.004$); and had worked in the early child care profession for fewer years ($p < 0.001$).

Nutrition-related Attitudes and Perceived barriers (Table 2)

Positive Attitudes: The most frequently endorsed positive nutrition attitudes (i.e., reported as agree a little or agree a lot by more than three quarters of providers) included: if only water is offered, children will drink enough (80.1%); if juice is limited, children will get enough vitamins (74.6%); the children like the taste of skim or low-fat milk (76.2%); it's important for child care providers to sit with children while they eat (96.5%); and child care settings affect children's lifelong eating habits (87.5%). The providers endorsed the following statements as reflecting their own personal behaviors and beliefs: You like the taste of the healthy food that children are supposed to eat (94.4%); You know how to encourage the children to try new foods (96.3%), You talk to children about healthy eating (96.9%); You find materials to use to teach children about nutrition (88.1%); You have enough time to prepare healthy food (90.5%); You sit at the table with children at meal and snack times (81.0%); You lead lessons about nutrition (92.1%); and You eat the same food as the children in their care (89.8%). Other positive attitudes

were not as frequently endorsed. Only 42.0% of providers agreed that children will take the right amount if they let them decide how much to eat and only 41.9% agreed that a picky eater should be left alone rather than pressured to try new food.

Some significant differences by ethnicity emerged in the frequency of positive provider-reported attitudes. Adjusting for education, Hispanic FCCPs were less likely to agree with the following positive statements than non-Hispanic FCCPs: if only water is offered, children would drink enough ($p = .001$); if fruit juice limited, children would get enough vitamins ($p = .009$); children like the taste of skim or low-fat (1%) milk ($p = .001$); dishes you make would taste just as good if made with whole grains ($p < .001$); you know how to encourage children to try new foods ($p < .001$); you know how to talk to children about healthy eating ($p < .001$); you have enough time to prepare healthy food ($p = .001$); you lead lessons about nutrition ($p < .001$); a picky eater should be left alone rather than pressured to try new food ($p = .013$). However, Hispanic FCCPs were more likely to agree with the following positive statements than non-Hispanic FCCPs: you like the taste of the healthy food that the children are supposed to eat ($p < .001$); you know how to find materials to use to teach children about nutrition ($p < .001$); you have enough time to sit at the table with the children at meal and snack times ($p < .001$); child care providers should eat the same food as the children in their care ($p < .001$); it is important for child care providers to sit with children while they eat ($p < .001$); child care settings affect children's lifelong eating habits ($p < .001$).

Negative attitudes: A majority of FCCP agreed (a little or agreed a lot) with two negative nutrition-related attitudes: serving the food at meal and snack time is the adult's responsibility (74.6%); and society has gone overboard limiting sweets and other desirable food (51.5%). Other negative nutrition-related attitudes were not agreed with as frequently including when

children serve themselves, they are likely to eat less (42.8%); how children eat while at child care has little or no effect on food habits because those are formed at home (42.5%); and giving children a food treat to reward good behavior is an effective way to manage their behavior (17.2%).

The frequency of some provider-reported negative attitudes also differed by ethnicity. Adjusting for education, Hispanic FCCPs were more likely to agree with the following negative statements than non-Hispanic FCCPs: serving the food at meal and snack is the adult's responsibility ($p < .001$); when children serve themselves, they are likely to eat less ($p = .011$); society has gone overboard limiting sweets and other desirable food ($p < .001$); how children eat while at child care has little or no effect on food habits because those are formed at home ($p < .001$).

Perceived Barriers: More than half of providers agreed (a little or a lot) with the following perceived barriers: if you let the children serve themselves, they will make too much of mess (56.4%), waste too much food (57.7%); and the children eat unhealthy foods at home, so it's hard to get them to eat healthy foods in your care (57.9%). Other nutrition-related barriers were not agreed with as frequently including: you are concerned about wasting food because the children won't eat healthy food (34.1%); it is hard to serve healthy foods because the children are picky (46.1); fresh fruits and vegetables go bad too quickly (46.8%) and are too expensive (30.9%) to be able to serve them very often.

The frequency of some provider-reported barriers also differed by ethnicity. Adjusting for education, Hispanic FCCPs were more likely to agree with the following perceived barriers than non-Hispanic FCCPs: if you let the children serve themselves, they will make too much of a mess ($p = .011$) and waste too much food ($p = .009$).

PA and ST-related Attitudes and Perceived barriers (Table 3)

Positive attitudes: Positive PA attitudes that more than three quarters of FCCP agreed with (a little or agree a lot) included: you have enough time to help the children be physically active (100%); know how to help the children be more physically active (95.3%); know how to get the children to be physically active during bad weather (96%); Parents send the right clothing for children to play outside (69%); Parents feel it is safe for children to play outside (88.1%); FCCPs know how to lead PA lessons (92%); they enjoy joining in with the children in play (99.4%); children behave better when they are given plenty of PA (96.4%); child care settings affect children's lifelong PA habits (88.7%). However, only 24.6% of FCCPs agreed that parents want children to go outside even when it's cold or raining.

The frequency of some positive provider-reported attitudes differed by ethnicity. Adjusting for education, Hispanic FCCPs were less likely to agree with the following positive attitudes than non-Hispanic FCCPs: you know how to help the children be more physically active ($p<.001$); parents feel it is safe for children to play outside ($p<.001$); child care settings affect children's lifelong PA habits ($p<.001$). However, Hispanic FCCPs were more likely to agree with the following attitudes: you know how to get the children to be physically active during bad weather ($p<.001$); parents send the right clothing for children to play outside ($p=.001$); you know how to lead PA lessons ($p<.001$); you enjoy joining in with the children in play ($p<.001$); children behave better when they are given plenty of PA ($p<.001$).

Negative attitudes: For Negative ST-related attitudes, 80.4% of FCCPs agreed (a little and a lot) that it is OK to let children watch educational programs on TV or the internet with Hispanic FCCPs more likely to agree ($p<.001$).

Barriers: Fewer than half of FCCP agreed with the following perceived barrier statements: children would rather watch TV or play videogames than do physical activities (32.5%); you get too tired to join in active play with the children (25.4%); the children are not physically active at home, so it's hard to get them to be physically active in your care (35.7%); the children have a lot of screen time at home, so it's hard to limit their screen time in your care (23.8%). In contrast, 77.0% of FCCPs agreed that they worry about the children's safety when they are playing outside. Adjusting for education, Hispanic FCCPs were more likely to agree with the following perceived barrier than non-Hispanic FCCPs: you worry about the children's safety when they are playing outside ($p=.009$).

Discussion

To date, there is little information on FCCP attitudes and beliefs that serve as facilitators or barriers to behaviors that promote nutrition and PA, including those that may vary by ethnicity. This study examines provider-reported nutrition, PA and ST-related attitudes and perceived barriers in FCCPs and explores differences between Hispanic and non-Hispanic providers.

Similar to prior studies of center-based child care settings^{66,123,124} qualitative studies in FCCBs,^{59,125} and our previous practice paper,¹⁰³ we found that many providers reported positive attitudes consistent with national guidelines and recommendations. Most FCCPs recognized their responsibility to provide quality nutrition and PA environments for children and believed that they have an important role in shaping children's eating behaviors and PA. For example, many FCCP agreed that it's important to eat with and do PA with children in their care. Hispanic providers were more likely than non-Hispanic providers to believe that they had an important role in shaping children's eating behaviors. They were also more likely than Non-Hispanic

providers to sit with children and eat the same food as children. Our qualitative research supported this view.¹⁰⁹ However, another qualitative study reported that FCCPs' ability to model healthy eating and PA behaviors for children in their care may be limited by their low self-efficacy to participate in these behaviors themselves.¹²⁶ Future interventions may also need to focus on helping FCCPs change their own eating and PA behaviors.^{127,128}

Most providers agreed that they knew how to encourage children's healthy eating and PA. They also agreed that they knew how to seek nutrition or PA-related training and provide both nutrition and PA education. Many FCCPs also showed agreement on some negative attitudes. For example, more than half of FCCP agreed that society has gone overboard limiting sweets and other desirable food. This is in line with previous research, which have shown that many FCCP don't meet best practice guidelines for limiting sugary foods in FCCHs.^{70,92,93,97,103}

In the current study, we did find differences between Hispanic and non-Hispanic providers in certain nutrition and PA-related attitudes and perceived barriers. In general, non-Hispanic providers were more likely to have positive nutrition-related attitudes. In addition, Hispanic FCCPs were more likely to report concerns about children not eating enough and felt the need to push or help children to eat, which is similar to research in both child care centers¹²⁹ and FCCHs,^{103,119} which found that Hispanic providers were more likely to use controlling feeding practices during children's mealtimes. Similarly, in our previous observation study, Hispanic providers were less likely than non-Hispanic to meet guidelines for never pressuring children to eat more food than they wanted.¹⁰³ A common belief in Hispanic culture that healthier children are heavier^{109,130,131} may influence how Hispanic FCCPs feed children. Evidence suggests that interventions with FCCP, especially Hispanic FCCP should focus on their propensity to use controlling and coercive feeding practices.

Regarding other feeding practices, we found that most FCCPs agreed that serving the food at meal and snack time is the adult's responsibility even though best practice guidelines recommend that children serve themselves to enhance self regulation of eating.⁷¹ For example, few FCCP agreed that if children served themselves they would take the right amount, with some of the providers agreeing that if children served themselves they would eat less and make too much of a mess. In addition, few providers agreed that a picky eater should be left alone rather than pressured to try new food. Overall, "pressure to eat" has been considered to be a negative behavior in terms of promoting self regulation and food acceptance,^{108,132} but some recent studies have shown that coercive "pressure" to eat healthy food had a longitudinal association with healthier BMI.^{133,134} The different findings in the literature regarding the relationship between pressure to eat and children's weight status may be due to the differences in definitions of the term "pressure to eat".^{39,132,134,135} Therefore, FCCPs should be reminded that it is their role to serve healthy foods and encourage children to select a balanced diet, but it is the child's role to decide how much to eat. Further, more research are needed on providers' feeding practices and the relationship between children's outcomes such as whether children can benefit from being pressured to eat healthy foods.

In our study, some FCCPs agreed that barriers to serving fresh fruits and vegetables included cost and fruits and vegetables going bad quickly. In addition, many of them concerned about wasting food when children served themselves with more Hispanic than Non-Hispanic FCCPs thought the children would waste food if they served themselves. This concern about wasting food may be due to the lower income levels of the Hispanic providers. Therefore, future interventions should focus on addressing food insecurity among low income FCCPs such as increasing reimbursement for CACFP, making sure that eligible providers enroll in the

Supplemental Nutritional Assistance Program (SNAP) and providing trainings for FCCPs on food budgeting or preparing meals on a budget.

Regarding PA, the majority of FCCPs agreed that they worried about the children's safety when they were playing outside, with Hispanic FCCPs worried more about safety than non-Hispanic FCCPs. In our previous qualitative research, Hispanic FCCPs also mentioned concerns for the children's safety.¹⁰⁹ This may be because Hispanic providers may be more likely to be living in unsafe neighborhoods, both in terms of crime and other built environment factors like traffic and less green space.¹³⁶ Our findings were consistent with previous research that found that issues of access, availability, cost, and safety were perceived as major barriers to a healthy lifestyle by low-income parents.^{137,138} Though a recent cross-sectional study did not find differences in nutrition and PA environments between urban and rural FCCHs,¹³⁹ evidence showed that funding and resources for PA equipment may be a challenge for rural and low-income providers,¹⁴⁰ while for providers living in urban environments may not have access to play spaces. Therefore, future interventions should also focus on recommending safe activities for FCCP to do with children both inside and outside in small spaces with limited equipment. Further, policy and environmental changes are needed to improve the built environment for children's PA including advocacy for more safe playgrounds and walkable streets to ensure the availability of places where children can play.

In our study, very few FCCPs agreed that children would rather watch TV or play videogames than do PA. However, we found that most FCCPs agreed that it is OK to let children watch educational programs on TV or the internet, with Hispanic FCCPs more likely to agree than Non-Hispanic. This is consistent with findings from other studies that child care providers rationalize the use of television in child care settings as an educational activity^{141,142}, While many

television shows are marketed as being educational for young children, studies have found that most educational programs on TV or the internet cannot compete with real life activities and human interaction.¹⁴³⁻¹⁴⁷ For example, a study compared the amount and style of maternal communication with toddlers and preschoolers while mother-child pairs read books, watched TV, and played with toys and found that one of the unforeseen consequences of TV viewing was reducing how much parents talk with their children.¹⁴⁶ This diminished interaction can have negative effects on children such as obesity,¹⁴⁸ aggression¹⁴⁹ and decreased attention spans,^{150,151} especially when they are young.¹⁴⁶ Though none of these studies were conducted in child care settings, opportunities for interactions with peers and providers, as well as outdoor play time, may also be displaced by passive television viewing in child care settings, especially in FCCHs.¹⁴² Similar to our findings that Hispanic FCCPs agreed significantly more on educational television viewing, evidence also showed lower income families, especially those from Hispanic-Latino heritage, reported that their children spent more time engaging with educational screen activities.¹⁵² Therefore, more research is needed to explore the ethnic differences in association between television viewing and children's development in child care settings, especially in FCCHs. Furthermore, future interventions should also focusing on screen time policies, screen time availability, and providing adequate time and space for PA in FCCHs.

FCCPs in the current study also saw the child's home environment as an important influence on children's health behaviors. Many FCCP's agreed that it was hard to change children's eating behaviors in light of habits formed at home. Previous qualitative research found that providers thought that if children were only served less nutritious "kid" foods at home, it may be hard for providers to get them to eat healthier foods in their care¹⁰⁹. Therefore, more efforts need to be made to reach children at home in addition to child care and to reach parents of

even younger children (prior to age 2) as food preferences are established early. In contrast, most providers did not think it was hard to get children to be physically active in their care if the children were not physically active at home. Though the family unit is important for the development of young children's PA-related attitudes, beliefs, preferences, and behaviors,^{153,154} many preschoolers spend most of their daytime hours in child care settings, making it an ideal place for promoting PA among this population.⁶¹⁻⁶³ Another issue that we found in our study is that many FCCPs agree that parents don't want their children to go outside when it is cold or raining. This finding results from previous qualitative research.¹⁰⁹ FCCP may be more apt to cater to parents' preferences than national or state guidelines because they are concerned about losing business. Thus, providers may need training in how to create FCCH policies and communicate better with parents regarding children's diet and PA and to help providers educate parents so that their preferences and at home practices can be improved. This in turn will make it easier for the provider to make children's diets and PA in the FCCH, and overall. Previous studies have shown that highly trained FCCPs were more likely to disseminate healthy nutrition or obesity prevention information to children and parents.¹⁵⁵ Thus, more training opportunities are needed for providers related to best practices in nutrition, PA, and ST, and better communication with families concerning children's eating behaviors, PA, and ST to eliminate misconceptions and inappropriate beliefs.

Limitations

This study does have some limitations. The study sample may not be representative of all FCCPs in our region because the sample is from those providers enrolling in an intervention study. However, demographics of the current sample mostly matched a previous statewide survey¹¹⁹ with the exception that the current sample has a higher proportion of Hispanic

providers. Furthermore, the current analysis uses self-reported data, which may have been influenced by socially desirable responses due to awareness of national attention to childhood obesity prevention. Furthermore, since most providers in our study were enrolled in CACFP, they may have been trained in how to answer appropriately regarding the nutrition questions. In addition, our previous study showed that FCCP self-reported data was often more positive than their actual practices measured using observational methods.¹⁰³ However, self-report survey methodology assesses subjective perceptions that are important for understanding patterns in social and intrapersonal phenomena. Future work may consider expanding the analyses to include other sources of data, for example, observations and archival reviews.

Implications for future intervention

These findings suggest that pediatric health care providers and policymakers should recognize FCCPs as important partners in obesity prevention. While FCCP have many positive attitudes regarding nutrition, PA and ST to support obesity prevention, approaches are needed to further support FCCPs in these efforts. FCCPs have a continuing need for training in best practice and policy guidelines to support high-quality child care and prevent childhood obesity. Training opportunities are needed for FCCPs to practice and integrate not only skills in nutrition and PA, but also child development principles, education, and effective parental communication strategies. For example, FCCPs could be trained to be a conduit to reach parents about nutrition, PA, and ST knowledge outside the child care setting, to ensure consistent messages, feeding, PA and ST practices between the FCCH and the home environment. In addition, research should further explore the role that FCCP ethnicity plays in shaping attitudes and perceived barriers. Future interventions should address child care policies and practices related to quality and

accessibility of healthy food and PA spaces within FCCHs and include attention to cultural differences.

Future research in FCCHs should include more objective studies that not only measure the environment including provider's diet, PA, and ST practices, foods served in their care, and the PA environment like actual play spaced, but also the relationship between providers' attitudes, and practices with children's diet, PA, ST and BMI. In addition, future intervention should focus on both parents and FCCPs to improve children's diet, PA, and ST behaviors.

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Tables

Table 1. Family Child Care Provider Demographics by Ethnicity

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p-value
			72%	28%	
Gender ^a (n=168)	Female	100 (168)	(121)	(47)	NA
Mean Age ^b (n=126)		48.8	49.6	47.2	0.185
Provider's Race ^a (n=168)	American Indian/Alaska Native	4.8 (8)	6.6 (8)	0 (0)	<0.001*
	Black/African American	13.7 (23)	14.0 (17)	12.8 (6)	
	Native Hawaiian/Pacific Islander	2.4 (4)	2.5 (3)	2.1 (1)	
	White/Caucasian	36.9 (62)	21.5 (26)	76.6 (36)	
	Other	28.0 (47)	37.2 (45)	4.3 (2)	
	Unknown	12.5 (21)	17.4 (21)	0 (0)	
	More than one	1.8 (3)	0.8 (1)	4.3 (2)	
Which of the following best describes your level of education? ^b (n=126)	No HS diploma or GED	11.1 (14)	15.3 (13)	2.4 (1)	0.021*
	HS Grad or GED	32.5 (41)	36.5 (31)	24.4 (10)	
	Associate's Degree	38.1 (48)	35.3 (30)	43.9 (18)	
	Bachelor's Degree	15.1 (19)	9.4 (8)	26.8 (11)	
	Master's Degree or higher	3.2 (4)	3.5 (3)	2.4 (1)	
What is your total yearly household income from all sources? ^b (n=122)	Less than \$25,000	13.9 (17)	19.3 (16)	2.6 (1)	<0.001*
	\$25,001-\$50,000	50.0 (61)	60.2 (50)	28.2 (11)	

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p-value
	\$50,001-\$75,000	20.5 (25)	16.9 (14)	28.2 (11)	
	\$75,001-\$100,000	9.8 (12)	3.6 (3)	23.1 (9)	
	\$100,001 or more	5.7 (7)	0 (0)	17.9 (7)	
What country were you born in? ^b (n=126)	USA	28.6 (36)	7.1 (6)	73.2 (30)	<0.001*
	Other	71.4 (90)	92.9 (79)	26.8 (11)	
What is your marital status? ^b (n=126)	Single, never married	11.1 (14)	12.9 (11)	7.3 (3)	0.363
	Married or living with a partner	72.2 (91)	68.2 (58)	80.5 (33)	
	Divorced	8.7 (11)	8.2 (7)	9.8 (4)	
	Separated	4.8 (6)	7.1 (6)	0 (0)	
	Widowed	3.2 (4)	3.5 (3)	2.4 (1)	
How many of those enrolled children are your own children or grandchildren? ^b (n=126)	0	64.3 (81)	65.9 (56)	61 (25)	0.651
	1	19.0 (24)	18.8 (16)	19.5 (8)	
	2	12.7 (16)	11.8 (10)	14.6 (6)	
	3	3.2 (4)	3.5 (3)	2.4 (1)	
	4	0.8 (1)	0 (0)	2.4 (1)	
Does your child care home accept CACFP subsidies (also known as the food program)? ^b (n=126)	YES	81.7 (103)	81.2 (69)	82.9 (34)	0.812
	NO	18.3 (23)	18.8 (16)	17.1 (7)	
Mean years live in USA ^b		23.4	22.6	29.6	0.021*
Mean number of children in FCCH ^b (range 1-16)		7.5	6.9	8.6	0.004*

Variable	Category	All % (n)	Hispanic^a % (n)	Non- Hispanic^a % (n)	p-value
Mean years working in early childhood profession ^b		12.7	11.1	16.2	<0.001*

*P<0.05 ^a Phone survey ^b In-person survey

Table 2 FCCP Nutrition-related Attitudes and Perceived Barriers of Family Child Care Providers by Ethnicity

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
Positive Attitudes								
If water was the only drink that you offered during play time, the children would drink enough. ^b					0.013*	-1.800	-3.177	0.001*
	Agree a lot	73.0 (92)	64.7 (55)	90.2 (37)				
	Agree a little	7.1 (9)	7.1 (6)	7.3 (3)				
	Neither agree nor disagree	1.6 (2)	2.4 (2)	0 (0)				
	Disagree a little	5.6 (7)	8.2 (7)	0 (0)				
	Disagree a lot	12.7 (16)	17.6 (15)	2.4 (1)				
If you were to limit the amount of 100% pure fruit juice the children drink, they would get enough vitamins ^b					0.740	-1.437	-2.615	0.009*
	Agree a lot	62.7 (79)	61.2 (52)	65.9 (27)				
	Agree a little	11.9 (15)	10.6 (9)	14.6 (6)				
	Neither agree nor disagree	1.6 (2)	1.2 (1)	2.4 (1)				
	Disagree a little	5.6 (7)	5.9 (5)	4.9 (2)				
	Disagree a lot	18.3 (23)	21.2 (18)	12.2 (5)				
The children like the taste of skim or lowfat (1%) milk. ^b					0.124	-1.800	-3.178	0.001*
	Agree a lot	66.7 (84)	61.2 (52)	78.0 (32)				
	Agree a little	9.5 (12)	10.6 (9)	7.3 (3)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Neither agree nor disagree	3.2 (4)	2.4 (2)	4.9 (2)				
	Disagree a little	7.9 (10)	8.2 (7)	7.3 (3)				
	Disagree a lot	12.7 (16)	17.6 (15)	2.4 (1)				
Some dishes you make would taste just as good if you made them with whole grains. ^b					0.044*	-2.375	-3.908	<0.001*
	Agree a lot	54.8 (69)	51.8 (44)	61.0 (25)				
	Agree a little	21.4 (27)	17.6 (15)	29.3 (12)				
	Neither agree nor disagree	4.8 (6)	7.1 (6)	0 (0)				
	Disagree a little	11.9 (15)	12.9 (11)	9.8 (4)				
	Disagree a lot	7.1 (9)	10.6 (9)	0 (0)				
If you let the children decide how much to eat, they will take the right amount ^b					0.062	-0.744	-1.406	0.160
	Agree a lot	19.8 (25)	21.2 (18)	17.1 (7)				
	Agree a little	22.2 (28)	15.3 (13)	36.6 (15)				
	Neither agree nor disagree	4.0 (5)	4.7 (4)	2.4 (1)				
	Disagree a little	17.5 (22)	16.5 (14)	19.5 (8)				
	Disagree a lot	36.5 (46)	42.4 (36)	24.4 (10)				
You like the taste of the healthy food that the children are supposed to eat ^b					0.867	-3.186	-4.468	<0.001*
	Agree a lot	84.9 (107)	84.7 (72)	85.4 (35)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Agree a little	9.5 (12)	10.6 (9)	7.3 (3)				
	Neither agree nor disagree	0.8 (1)	1.2 (1)	0 (0)				
	Disagree a little	1.6 (2)	1.2 (1)	2.4 (1)				
	Disagree a lot	3.2 (4)	2.4 (2)	4.9 (2)				
You know how to encourage the children to try new foods ^b					0.940	-3.474	-4.516	<0.001*
	Agree a lot	79.4 (100)	80.0 (68)	78.0 (32)				
	Agree a little	17.5 (22)	16.5 (14)	19.5 (8)				
	Disagree a little	0.8 (1)	1.2 (1)	0 (0)				
	Disagree a lot	2.4 (3)	2.4 (2)	2.4 (1)				
You know how to talk to children about healthy eating. ^b					0.695	-4.573	-4.076	<0.001*
	Agree a lot	75.4 (95)	72.9 (62)	80.5 (33)				
	Agree a little	20.6 (26)	21.2 (18)	19.5 (8)				
	Neither agree nor disagree	0.8 (1)	1.2 (1)	0 (0)				
	Disagree a little	2.4 (3)	3.5 (3)	0 (0)				
	Disagree a lot	0.8 (1)	1.2 (1)	0 (0)				
You know how to find materials to use to teach children about nutrition. ^b					0.786	-2.963	-4.376	<0.001*
	Agree a lot	67.5 (85)	67.1 (57)	68.3 (28)				
	Agree a little	20.6 (26)	21.2 (18)	19.5 (8)				
	Neither agree nor disagree	2.4 (3)	1.2 (1)	4.9 (2)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Disagree a little	5.6 (7)	5.9 (5)	4.9 (2)				
	Disagree a lot	4.0 (5)	4.7 (4)	2.4 (1)				
You have enough time to prepare healthy food as often as you would like ^b					0.433	-2.781	-4.265	<0.001*
	Agree a lot	79.4 (100)	81.2 (69)	75.6 (31)				
	Agree a little	11.1 (14)	8.2 (7)	17.1 (7)				
	Disagree a little	4.8 (6)	4.7 (4)	4.9 (2)				
	Disagree a lot	4.8 (6)	5.9 (5)	2.4 (1)				
You have enough time to sit at the table with the children at meal and snack times ^b					0.054	-2.175	-3.680	<0.001*
	Agree a lot	66.7 (84)	69.4 (54)	61.0 (25)				
	Agree a little	14.3 (18)	27.1 (23)	19.5 (8)				
	Neither agree nor disagree	4.8 (6)	4.7 (4)	0 (0)				
	Disagree a little	5.6 (7)	1.2 (1)	12.2 (5)				
	Disagree a lot	8.7 (11)	3.5 (3)	7.3 (3)				
You have enough time lead lessons about nutrition ^b					0.590	-3.186	-4.468	<0.001*
	Agree a lot	62.7 (79)	63.5 (54)	61.0 (25)				
	Agree a little	29.4 (37)	27.1 (23)	34.1 (14)				
	Neither agree nor disagree	3.2 (4)	4.7 (4)	0 (0)				
	Disagree a little	1.6 (2)	1.2 (1)	2.4 (1)				
	Disagree a lot	3.2 (4)	3.5 (3)	2.4 (1)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
Child care providers should eat the same food as the children in their care. ^{ac}					<0.001*	-3.880	-4.455	<0.001*
	Agree a lot	82.1 (138)	90.9 (110)	59.6 (28)				
	Agree a little	7.7 (13)	5.8 (7)	12.8 (6)				
	Neither agree nor disagree	5.4 (9)	0.8 (1)	17.0 (8)				
	Disagree a little	3.0 (5)	0.8 (1)	8.5 (4)				
	Disagree a lot	1.8 (3)	1.7 (2)	2.1 (1)				
It is important for child care providers to sit with children while they eat. ^{ac}					0.636	-3.880	-4.454	<0.001*
	Agree a lot	91.7 (154)	93.4 (113)	87.2 (41)				
	Agree a little	4.8 (8)	3.3 (4)	8.5 (4)				
	Neither agree nor disagree	1.8 (3)	1.7 (2)	2.1 (1)				
	Disagree a little	0.6 (1)	0.8 (1)	0 (0)				
	Disagree a lot	1.2 (2)	0.8 (1)	2.1 (1)				
A picky eater should be left alone rather than pressured to try new food. ^{ac}					0.138	-1.354	-2.478	0.013*
	Agree a lot	30.5 (51)	25.0 (30)	44.7 (21)				
	Agree a little	11.4 (19)	10.8 (13)	12.8 (6)				
	Neither agree nor disagree	13.2 (22)	13.3 (16)	12.8 (6)				
	Disagree a little	22.2 (37)	25.0 (30)	14.9 (7)				
	Disagree a lot	22.8 (38)	25.8 (31)	14.9 (7)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
Child care settings affect children's lifelong eating habits. ^{ac}					0.556	-4.573	-4.076	<0.001*
	Agree a lot	66.1 (111)	68.6 (83)	59.6 (28)				
	Agree a little	21.4 (36)	19.0 (23)	27.7 (13)				
	Neither agree nor disagree	7.1 (12)	6.6 (8)	8.5 (4)				
	Disagree a little	4.2 (7)	5.0 (6)	2.1 (1)				
	Disagree a lot	1.2 (2)	0.8 (1)	2.1 (1)				
Negative Attitudes								
Serving the food at meal and snack time is the adult's responsibility ^b					<0.001*	-2.175	-3.680	<0.001*
	Agree a lot	62.7 (79)	75.3 (64)	36.6 (15)				
	Agree a little	11.9 (15)	8.2 (7)	19.5 (8)				
	Neither agree nor disagree	6.3 (8)	5.9 (5)	7.3 (3)				
	Disagree a little	10.3 (13)	5.9 (5)	19.5 (8)				
	Disagree a lot	8.7 (11)	4.7 (4)	17.1 (7)				
When children serve themselves, they are likely to eat less. ^{ac}					<0.001*	-1.395	-2.545	0.011*
	Agree a lot	22.0 (37)	26.9 (32)	10.6 (5)				
	Agree a little	20.8 (35)	22.7 (32)	6.4 (3)				
	Neither agree nor disagree	13.1 (22)	12.6 (15)	14.9 (7)				
	Disagree a little	25.6 (43)	27.7 (33)	21.3 (10)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Disagree a lot	17.3 (29)	5.9 (7)	46.8 (22)				
Giving children a food treat to reward good behavior is an effective way to manage their behavior. ^{ac}					0.107	-0.216	-0.415	0.678
	Agree a lot	10.1 (17)	13.2 (16)	2.1 (1)				
	Agree a little	7.1 (12)	7.4 (9)	6.4 (3)				
	Neither agree nor disagree	6.5 (11)	4.3 (9)	4.3 (2)				
	Disagree a little	14.3 (24)	10.6 (19)	10.6 (5)				
	Disagree a lot	61.9 (104)	76.6 (68)	76.6 (36)				
overboard limiting sweets and other desirable food. ^{ac}					0.147	-4.573	-4.076	<0.001*
	Agree a lot	33.3 (55)	36.4 (44)	23.4 (11)				
	Agree a little	18.2 (30)	17.4 (21)	19.1 (9)				
	Neither agree nor disagree	10.9 (18)	7.4 (9)	19.1 (9)				
	Disagree a little	13.3 (22)	14.9 (18)	8.5 (4)				
	Disagree a lot	24.2 (40)	21.5 (26)	29.8 (14)				
How children eat while at child care has little or no effect on food habits because those are formed at home ^{ac}					<0.001*	-3.474	-4.516	<0.001*
	Agree a lot	26.1 (43)	33.1 (39)	10.8 (4)				
	Agree a little	16.4 (27)	19.5 (23)	8.5 (4)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Neither agree nor disagree	8.5 (14)	7.6 (9)	8.5 (5)				
	Disagree a little	17.0 (28)	19.5 (23)	10.6 (5)				
	Disagree a lot	32.1 (53)	20.3 (24)	61.7 (29)				
Perceived Barriers								
You are concerned about wasting food because the children won't eat healthy foods. ^b					0.013*	-0.462	-0.881	0.378
	Agree a lot	25.4 (32)	34.1 (29)	7.3 (3)				
	Agree a little	8.7 (11)	7.1 (6)	12.2 (5)				
	Neither agree nor disagree	1.6 (2)	1.2 (1)	2.4 (1)				
	Disagree a little	15.9 (20)	11.8 (10)	24.4 (10)				
	Disagree a lot	48.4 (61)	45.9 (39)	53.7 (22)				
Perceived Barriers								
It is hard to serve healthy foods because the children are picky. ^b					0.129	-0.681	-1.289	0.197
	Agree a lot	27.8 (35)	30.6 (26)	22.0 (9)				
	Agree a little	18.3 (23)	18.8 (16)	17.1 (7)				
	Neither agree nor disagree	2.4 (3)	0 (0)	7.3 (3)				
	Disagree a little	12.7 (16)	12.9 (11)	12.2 (5)				
	Disagree a lot	38.9 (49)	37.6 (32)	41.5 (17)				
Perceived Barriers								
If you let the children serve themselves, they will make too much of a mess ^b					0.067	-1.395	-2.545	0.011*

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Agree a lot	38.1 (48)	43.5 (37)	26.8 (11)				
	Agree a little	18.3 (23)	17.6 (15)	19.5 (8)				
	Neither agree nor disagree	6.3 (8)	8.2 (7)	2.4 (1)				
	Disagree a little	18.3 (23)	17.6 (15)	19.5 (8)				
	Disagree a lot	19.0 (24)	12.9 (11)	31.7 (13)				
If you let the children serve themselves, they will waste too much food ^b					0.132	-1.437	-2.615	0.009*
	Agree a lot	39.4 (37)	31.8 (27)	24.4 (10)				
	Agree a little	18.3 (23)	18.8 (16)	17.1 (7)				
	Neither agree nor disagree	8.7 (11)	5.9 (5)	14.6 (6)				
	Disagree a little	25.4 (32)	29.4 (25)	17.1 (7)				
	Disagree a lot	18.3 (23)	14.1 (12)	26.8 (11)				
The children eat unhealthy foods at home, so it's hard to get them to eat healthy foods in your care ^b					0.291	-1.017	-1.899	0.058
	Agree a lot	34.9 (44)	40.0 (34)	24.4 (10)				
	Agree a little	23.0 (29)	20.0 (17)	29.3 (12)				
	Neither agree nor disagree	2.4 (3)	1.2 (1)	4.9 (2)				
	Disagree a little	11.9 (15)	10.6 (9)	14.6 (6)				
	Disagree a lot	27.8 (35)	28.2 (24)	26.8 (11)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non-Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
Fresh fruits and vegetables go bad too quickly to be able to serve them very often ^b					0.124	-0.602	-1.144	0.253
	Agree a lot	33.3 (42)	37.6 (32)	24.4 (10)				
	Agree a little	13.5 (17)	16.5 (14)	7.3 (3)				
	Neither agree nor disagree	2.4 (3)	2.4 (2)	2.4 (1)				
	Disagree a little	8.7 (11)	9.4 (8)	7.3 (3)				
	Disagree a lot	42.1 (53)	34.1 (29)	58.5 (24)				
Fresh fruits and vegetables are too expensive to serve as often as you would like ^b					0.303	-0.353	-0.676	0.499
	Agree a lot	20.6 (26)	23.5 (20)	14.6 (6)				
	Agree a little	10.3 (13)	11.8 (10)	7.3 (3)				
	Neither agree nor disagree	0.8 (1)	0 (0)	2.4 (1)				
	Disagree a little	14.3 (18)	15.3 (13)	12.2 (5)				
	Disagree a lot	54.0 (68)	49.4 (42)	63.4 (26)				

*P<0.05

^a Phone survey

^b In-person survey

^c From Lanigan Child Care Provider Healthy Eating and Activity Survey.

^d General log-linear analysis controlled for education values refer to estimates for the model's constant. The models have only main effects included (and no interactions).

Table 3 FCCP Physical Activity-related Attitudes and Perceived Barriers of Family Child Care Providers by Ethnicity

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
Positive Attitudes								
You have enough time to help the children be physically active. ^b					0.754	-0.573	-1.234	0.217
	Agree a lot	91.3 (115)	90.6 (77)	92.7 (38)				
	Agree a little	8.7 (11)	9.4 (8)	7.3 (3)				
Barriers								
You know how to help the children be more physically active. ^b					0.364	-3.474	-4.516	<0.001*
	Agree a lot	81.0 (102)	76.5 (65)	90.2 (37)				
	Agree a little	14.3 (18)	16.5 (14)	9.8 (4)				
	Neither agree nor disagree	0.8 (1)	1.2 (1)	0 (0)				
	Disagree a little	1.6 (2)	2.4 (2)	0 (0)				
	Disagree a lot	2.4 (3)	3.5 (3)	0 (0)				
Weather								
You know how to get the children to be physically active during bad weather. ^b					0.170	-4.573	-4.076	<0.001*
	Agree a lot	70.4 (88)	67.9 (57)	22.6 (31)				
	Agree a little	25.6 (32)	29.8 (25)	16.1 (7)				
	Neither agree nor disagree	0.8 (1)	1.2 (1)	9.7 (0)				
	Disagree a little	1.6 (2)	0 (0)	12.9 (2)				
	Disagree a lot	1.6 (2)	1.2 (1)	38.7 (1)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
Parents send the right clothing for children to play outside. ^b					<0.001*	-1.865	-3.270	0.001*
	Agree a lot	46.0 (58)	60.0 (51)	17.1 (7)				
	Agree a little	23.0 (29)	15.3 (13)	39.0 (16)				
	Neither agree nor disagree	5.6 (7)	4.7 (4)	7.3 (3)				
	Disagree a little	13.5 (17)	11.8 (10)	17.1 (7)				
	Disagree a lot	11.9 (15)	8.2 (7)	19.5 (8)				
Parents want children to go outside even when it's cold or raining. ^b					0.769	-0.565	-1.075	0.282
	Agree a lot	9.5 (12)	7.1 (6)	14.6 (6)				
	Agree a little	15.1 (19)	15.3 (13)	14.6 (6)				
	Neither agree nor disagree	3.2 (4)	3.5 (3)	2.4 (1)				
	Disagree a little	28.6 (36)	29.4 (25)	26.8 (11)				
	Disagree a lot	43.7 (55)	44.7 (38)	41.5 (17)				
Parents feel it is safe for children to play outside. ^b					0.041*	-2.963	-4.376	<0.001*
	Agree a lot	73.0 (92)	64.7 (55)	90.2 (37)				
	Agree a little	15.1 (19)	20.0 (17)	4.9 (2)				
	Neither agree nor disagree	3.2 (4)	4.7 (4)	0 (0)				
	Disagree a little	4.8 (6)	5.9 (5)	2.4 (1)				
	Disagree a lot	4.0 (5)	4.7 (4)	2.4 (1)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
You know how to lead physical activity lessons. ^b					0.006*	-4.573	-4.076	<0.001*
	Agree a lot	68.8 (86)	63.1 (53)	80.5 (33)				
	Agree a little	23.2 (29)	31.0 (26)	7.3 (3)				
	Neither agree nor disagree	1.6 (2)	2.4 (2)	0 (0)				
	Disagree a little	4.0 (5)	1.2 (1)	9.8 (4)				
	Disagree a lot	2.4 (3)	2.4 (2)	2.4 (1)				
You enjoy joining in with the children in play. ^a					0.357	-2.963	-4.379	<0.001*
	Agree a lot	94.6 (159)	95.0 (115)	93.6 (44)				
	Agree a little	4.8 (8)	5.0 (6)	4.3 (2)				
	Neither agree nor disagree	0.6 (1)	0 (0)	2.1 (1)				
Children behave better when they are given plenty of physical activity. ^a					0.315	-4.573	-4.076	<0.001*
	Agree a lot	88.7 (149)	86.8 (105)	93.6 (44)				
	Agree a little	7.7 (13)	9.9 (12)	2.1 (1)				
	Neither agree nor disagree	3.0 (5)	2.5 (3)	4.3 (2)				
	Disagree a little	0.6 (1)	0.8 (1)	0 (0)				
Child care settings affect children's lifelong physical activity habits. ^a					0.171	-3.186	-4.468	<0.001*
	Agree a lot	71.4 (120)	71.9 (87)	70.2 (33)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
	Agree a little	17.3 (29)	14.0 (17)	25.5 (12)				
	Neither agree nor disagree	3.6 (6)	4.1 (5)	2.1 (1)				
	Disagree a little	4.8 (8)	6.6 (8)	0 (0)				
	Disagree a lot	3.0 (5)	3.3 (4)	2.1 (1)				
Negative Attitudes								
It is OK to let children watch educational programs on TV or the internet. ^a					0.559	-3.186	-4.469	<0.001*
	Agree a lot	28.0 (47)	31.4 (38)	19.1 (9)				
	Agree a little	52.4 (88)	51.2 (62)	55.3 (26)				
	Neither agree nor disagree	11.9 (20)	10.7 (13)	14.9 (7)				
	Disagree a little	4.8 (8)	4.1 (5)	6.4 (3)				
	Disagree a lot	3.0 (5)	2.5 (3)	4.3 (2)				
Perceived Barriers								
The children would rather watch TV or play videogames than do physical activities. ^b					0.011*	-0.383	-0.732	0.464
	Agree a lot	22.2 (28)	27.1 (23)	12.2 (5)				
	Agree a little	10.3 (13)	15.3 (13)	0 (0)				
	Neither agree nor disagree	4.0 (5)	3.5 (3)	4.9 (2)				
	Disagree a little	11.1 (14)	9.4 (8)	14.6 (6)				
	Disagree a lot	52.4 (66)	44.7 (38)	68.3 (28)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
You get too tired to join in active play with the children. ^b					0.234	-0.242	-0.464	0.642
	Agree a lot	7.9 (10)	11.8 (10)	0 (0)				
	Agree a little	17.5 (22)	16.5 (14)	19.5 (8)				
	Neither agree nor disagree	1.6 (2)	1.2 (1)	2.4 (1)				
	Disagree a little	12.7 (16)	12.9 (11)	12.2 (5)				
	Disagree a lot	60.3 (76)	57.6 (49)	65.9 (27)				
You worry about the children's safety when they are playing outside. ^b					<0.001*	-1.437	-2.615	0.009*
	Agree a lot	71.4 (90)	95.3 (81)	22.0 (9)				
	Agree a little	5.6 (7)	1.2 (1)	14.6 (6)				
	Disagree a little	4.8 (6)	1.2 (1)	12.2 (5)				
	Disagree a lot	18.3 (23)	2.4 (2)	51.2 (21)				
The children are not physically active at home, so it's hard to get them to be physically active in your care. ^b					0.175	-0.681	-1.289	0.197
	Agree a lot	25.4 (32)	27.1 (23)	22.0 (9)				
	Agree a little	10.3 (13)	12.9 (11)	4.9 (2)				
	Neither agree nor disagree	4.0 (5)	4.7 (4)	2.4 (1)				
	Disagree a little	21.4 (27)	23.5 (20)	17.1 (7)				
	Disagree a lot	38.9 (49)	31.8 (27)	53.7 (22)				

Variable	Category	All % (n)	Hispanic ^a % (n)	Non- Hispanic ^a % (n)	p	Adjusted		
						Estimate	Z	p
The children have a lot of screen time at home, so it's hard to limit their screen time in your care. ^b					0.960	-0.203	-0.390	0.696
	Agree a lot	11.9 (15)	10.6 (9)	14.6 (6)				
	Agree a little	11.9 (15)	11.8 (10)	12.2 (5)				
	Neither agree nor disagree	2.4 (3)	2.4 (2)	2.4 (1)				
	Disagree a little	11.1 (14)	10.6 (9)	12.2 (5)				
	Disagree a lot	62.7 (79)	64.7 (55)	58.5 (24)				

*P<0.05

^a Phone survey

^b In-person survey

^c General log-linear analysis controlled for education values refer to estimates for the model's constant. The models have only main effects included (and no interactions).