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Fruits and Vegetables at Home: Child and Parent Perceptions

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Abstract

Objective—Examine child and parent perceptions of home food environment factors and associations with child fruit and vegetable (FV) intake

Design—Research staff administered surveys to children during after-school sessions and parents completed surveys by mail or over the phone

Setting—Four urban elementary schools in St. Paul, Minnesota, serving primarily low-income populations

Participants—73 children (55 girls, 18 boys) participating in a theater-based intervention aimed at obesity prevention and one parent/guardian per child

Main Outcome Measures—Perceptions of home food environment factors (home FV availability, home FV accessibility; parental encouragement to eat FV; family meal frequency).

Analysis—Descriptive statistics and paired t-tests

Results—On average, child and parent perceptions of the home food environment were similar. When comparing child-parent dyad perceptions of home food environment, moderate to high level of agreement (56%–86%) was found. Child report of home FV availability, home FV accessibility, parental encouragement to eat FV, and family meal frequency explained 26.7% of the variance in child FV intake; whereas, parent report of these factors explained 4.9% of the variance.

Conclusions and Implications—It is important to understand both child and parent perceptions of the home food environment when developing interventions aimed at increasing child FV intake.

Keywords

child; parent; fruit and vegetable intake; home environment

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Introduction

Despite the evidence in support of health benefits associated with fruit and vegetable intake [1], national data indicate that fewer than 25% of boys and girls ages 9-13 consume five or more servings of fruits and vegetables daily [2]. Furthermore, youth from families with low socioeconomic status are likely to consume the fewest daily servings of fruits and vegetables [3]. Efforts are currently underway to investigate the most effective approaches for promoting increased fruit and vegetable (FV) intake among youth. A variety of factors within the home environment may be associated with youth FV intake; the strongest include home availability and accessibility of FV [3-5], parental FV intake [3,5-8], and family meal frequency [9-11].

When evaluating the impact of home environmental influences, it may be important to consider both child or parent perceptions. Research suggests that children and parents may perceive the home environment somewhat differently [4,12-16]. In a study with 6th and 7th grade Norwegian students and parents, parents perceived their children's FV accessibility to be better than what was reported by the children [14]. Similarly, van Assema and colleagues found that, on average, parents reported higher fruit availability/accessibility than their 12-14 year old children; however, they also found that 70% of parents and children shared similar views on fruit accessibility [12]. It is important to identify whether parents and children perceive the home environment differently, because if parents perceive a higher level of home FV availability and accessibility, they may be less likely to engage in behaviors to change the home environment to facilitate children's FV intake.

While some studies evaluating similarities and differences between child and parent perceptions of the home food environment have been conducted [4,12-16], few have explored child-parent perceptions among youth from low-income, ethnically diverse families at increased risk for low FV intake. The objectives of this study are to 1) identify relationships between child-report and parent-report of home food environment factors (home availability and accessibility of FV; parental encouragement to eat FV; family meal frequency) and 2) identify whether child or parent report of home food environment variables is more strongly correlated with child FV intake. The present study extends on previous research by reporting child and parental perceptions of the home food environment using data from an ethnically diverse, primarily low-income sample of male and female public elementary school children and their parents within an urban area in the United States.

Description of Evaluation

Study Population and Design

The study population for these analyses included 73 children (55 girls and 18 boys) and one parent or guardian per child who participated in an evaluation of the *Ready. Set. ACTION!* (RSA) program, a theater-based pilot study aimed at obesity prevention [17]. Baseline data from the RSA study included 108 4th-6th grade students; however, data from the 35 children whose parents did not complete the baseline survey were excluded from these analyses. Children were recruited from four urban elementary schools in St. Paul, MN that serve primarily low-income populations; approximately 90% of the students at each school qualify for free or reduced school lunch [17]. The mean age of the children included in these analyses was 10.1 years (standard deviation = 1.1). The child self-reported ethnic distribution was as follows: African American 57% (n=42), Asian/Hmong 11% (n=8), White 8% (n=6), Hispanic 3% (n=2), and mixed/other 21% (n=15). The parent/caregiver sample included 70% (n=51) mothers, 12% (n=9) fathers, 4% (n=3) stepmothers, 4% (n=3) grandmothers, 4% (n=3) aunts, 1% (n=1) uncle and 4% (n=3) other guardians.

Written consent was obtained from parents or primary caregivers for participation in the study, as well as for their child to participate in the study. The children also signed a written assent form. Ethical approval for this study was received from the Institutional Review Board of the University of Minnesota and the Saint Paul Schools Research Committee.

Survey Tools and Data Collection

The development of the RSA child and parent surveys was guided by a theoretical framework (Social Cognitive Theory) [18,19], a review of existing instruments [8,20-26], and a pilot test of the student survey with nine 4th - 6th grade students to assess the clarity of questions and time required to complete the survey. Survey questions and scales were adapted from existing instruments [8,20-26]. Trained research staff administered the child survey during afterschool sessions, which took approximately 25- 45 minutes to complete. Research staff reviewed the children's completed surveys immediately after completion to identify items that they may have accidentally missed. Parent surveys were sent home to parents/caregivers for them to complete and return using a postage paid envelope. Approximately 10% of parents/caregivers who did not return their survey by mail, completed the survey over the phone with research staff.

Survey and Measures

Availability of Fruit and Vegetables within the Home—Child and parent-report of home FV availability was assessed using a 3-item scale [25,26], which asked children and parents “How often are the following true? 1) We have fruits and vegetables in my home, 2) In my home, vegetables are served at meals, 3) In my home, fruit is served for dessert.” Response options were hardly ever, sometimes, often, almost always (Cronbach alpha = 0.68 child sample; 0.61 parent sample). For analysis, overall scale had a range or 3-12, and was dichotomized as 3-7 (low availability) vs 8-12 (high availability).

Accessibility of Fruit and Vegetables within the Home—Child and parent-report of home FV accessibility was assessed using a 4-item scale [25]. The child survey asked, “How often are the following true? 1) In my home, there is fruit available to have as a snack, 2) In my home, there are vegetables to have as a snack, 3) In my home, there are cut-up vegetables in the fridge for me to eat, 4) In my home, there are fresh fruit on the counter, table, or somewhere else where I can easily get to them.” Response options were hardly ever, sometimes, often, almost always. Parent survey questions were identical to the child survey with the exception that each question referred to the child's accessibility. (Cronbach alpha = 0.72 child sample, 0.78 parent sample). For analysis, overall scale had a range or 4-16, and was dichotomized as 4-9 (low accessibility) vs 10-16 (high accessibility).

Parental Encouragement to Eat Fruit and Vegetables—Child and parent-report of parental encouragement to eat FV was assessed using a 3-item scale [23,25]. The child survey asked children “During a typical week how often are the following true? 1) My parents/guardians try to get me to eat more fruit; 2) My parents/guardians try to get me to eat more vegetables, 3) My parents/guardians buy fruits and vegetables they know I like.” Response options were not at all, sometimes, almost every day, every day (Cronbach alpha = 0.79). The parent survey asked, “During a typical week how often have you or another member of your household: 1) Bought fruit or vegetables you know this child likes, 2) Encouraged this child to eat more fruit? 3) Encouraged this child to eat more vegetables?” Response options were not at all, sometimes, almost every day, every day (Cronbach alpha = 0.83). For analysis, overall scale had a range or 3-12, and was dichotomized as 3-7 (low parental encouragement) vs 8-12. (high parental encouragement).

Family Meal Frequency—Family meal frequency was assessed via the following child and parent survey questions [26]: “During the past week, how many times did all, or most, of your family living in your house eat a meal together?” Response options were never, 1-2 times, 3-4 times, 5-6 times, and 7 or more times. For analysis, regular family meals was defined as 5 or more meals together in the past week.

Fruit and Vegetable Intake—Fruit and vegetable intake was assessed via the following child and parent survey questions [8]: “How many servings of fruit do you usually eat on a typical day? (A serving is a medium piece of fruit)” “How many servings of vegetables do you usually eat on a typical day? (A serving is about a half a cup of vegetables)” Response options included none, 1 serving, 2 servings, 3, servings, 4, servings, 5 or more servings. Report of typical daily fruit and vegetable servings were summed and evaluated as a combined measure of FV intake.

Parent/Caregiver Relationship to Child—Parent/caregiver relationship to child was assessed with the parent survey question: “What is your relationship to (insert child's name)?” Response options were mother, father, stepmother, stepfather, grandmother, grandfather, aunt, uncle, other.

Data Analysis

For each of the questions in the three areas of home availability and home accessibility of FV, and parental encouragement to eat FV, the percentages of children and of parents responding in the 2 higher (of 4) categories were calculated; these percentages were compared by paired t-tests. Similar procedures were used to calculate and test percentages of children (and of parents) reporting having family meals 5 or more times per week. Another measure, agreement of response among parent-child dyads, was operationally defined as child and parent responses differing by ≤ 1 step on a 4-point Likert scale. In these pilot data, p-values are used as pointers to interesting aspects of the data, not as strict statistical testing.

Regression modeling was used to examine associations of home food environment factors (both child and parent-report) with child self-reported FV intake. Child's age, race/ethnicity (black/other), gender, and parent education were controlled in all regression models. R-squared values from parent and child models were compared using the method as described by Alf and Graf [27]. All p-values were two-sided, with $p < 0.05$ considered statistically significant. Analyses were conducted using SAS software (version 8.2; SAS Institute Inc., Cary, NC).

Lessons Learned

The majority of children and parents perceived a high overall level of home FV availability (74.6% children, 81.7% parents). A slightly lower proportion perceived a high overall level of home FV accessibility (64.4% children, 72.3% parents). Parental encouragement to eat FV was reported by 52.8% of children and 65.3% of parents. Regular family meals were reported by 41.4% of children and 48.6% of parents (Table 1). No statistically significant differences were found between children and parents for any of the scaled home environment variables (Table 1). The percentage of child-parent pairs sharing similar perceptions (as expressed in terms of agreement) of the home food environment ranged from 56% to 86% (Table 1).

On average, parents and children reported higher than expected levels of FV consumption. Reported mean (SD) daily fruit and vegetable intake was 4.8 (.27) servings among children and 4.9 (.28) servings among parents. Child report of home FV availability, home FV accessibility, parental encouragement to eat FV, and family meal frequency explained 26.7% of the variance in child FV intake after adjusting for race/ethnicity, gender, and parent

education; whereas, parent report of the same home food environment variables explained only 4.9% of the variance.

Discussion

The present study compared child and parent perceptions of the home fruit and vegetable environment. In general, child and parent perceptions of the home food environment were similar. A large percentage of both children and parents reported high FV availability and accessibility (Table 1). When comparing child-parent dyads, the majority (56% to 86%) shared similar perceptions of home FV availability and accessibility, parental encouragement to eat FV, and family meal frequency. While the majority of child-parent dyads shared similar perceptions of the home food environment, over 30% of the parent-child pairs differed in their perceptions on more than half of the home food environment variables measured. This finding is comparable to research results reported by van Assema and colleagues [12], who found that disagreement by more than one category across pairs of children and parents ranged from 9-30% with regard to fruit availability and accessibility. Other research has reported moderate discordance between perceptions among youth and parents with regard to FV accessibility and FV behavioral skills [14] and family mealtime environment factors [13]. It is interesting to note that parents in the present study tended to report higher levels of overall FV availability, FV accessibility, parental encouragement to eat FV, and regular family meals; however, these findings were not statistically significant (Table 1). Taken together, these findings may suggest that parents in this study perceived a more supportive home food environment than the children, which is consistent with previous research [12,14].

Findings from this study indicate that when compared to parent perceptions, child perceptions of the home food environment were more strongly associated with child FV intake. Child-reported home food environment perceptions accounted for about 27% of the variance in child FV intake. Previous research with 4th to 6th grade boys and girls has indicated that child-reported home fruit, fruit juice, and vegetable availability and accessibility predicted intake, accounting for 10% of the variance in the overall population and 35% of the variance in a girls-only model [4]. The stronger association between child perception of the home food environment and FV intake may be, at least in part, due to the possibility that children who eat fruits and vegetables are more aware of their presence in the home. However, the cross-sectional nature of this study does not allow for the disentanglement of temporality.

The results of this study suggest that while the majority of children and parents may share similar perceptions of the home food environment; a moderate proportion view the home environment differently. This finding indicates that it may be beneficial to obtain both parent and child perspectives of the home environment when conducting future research. A major strength of the study was the collection of data from both children and parents from low-income and ethnically diverse backgrounds. However, because this study utilized a small convenience sample and did not control for a variety of possible confounding variables, we are unable to make generalizations beyond the population measured. Additionally, the small sample size, did not allow for an examination of gender differences among children. Furthermore, FV intake among child participants may have been an overestimate [2].

Implications for Research and Practice

In designing studies to examine determinants of children's dietary intake, and exploring the potential influence of the home environment on intake, the question often emerges as to whether we need to collect data from both children and parents. Findings from the current study suggest the importance of both. While the majority of parents and children may share similar perceptions of the home food environment, a moderate proportion of parents and children may

not perceive their home environment similarly. Parents may perceive the home to have high level of FV availability and accessibility and perceive themselves as encouraging their children to eat FV; however, there is a risk that these same perceptions may not be held by their children. In an effort to capture divergent perspectives and refine intervention strategies, future research might benefit from assessing both child and parent perceptions, prior to targeting interventions. Additionally, nutrition educators should consider informing parents of the potential for differences in child and parent perceptions of the home food environment and share strategies aimed at increasing home FV availability/accessibility and promoting increased awareness among children.

Future research using a larger study population and improved FV intake measures could provide additional insight into child and parent perceptions of the home environment and associations with child FV intake. Additionally, further qualitative research could better clarify why there are differences between child and parent perceptions and what these differences might mean.

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Table 1

Children and Parents Reporting High ^a Levels of FV Home Availability, Accessibility, Encouragement, and Regular Family Meals and Level of Agreement Across Child-Parent Dyads.

FV Home Environment Variable	Percentage Reporting High Levels			paired t-test	Percentage Agreement ^c across Child-Parent Dyads (N=73)
	Child (N=73)	Parent (N=73)			
	Percent	Percent	p-value	Percent	
Home Availability					
Fruit available in the home	83.1	8.7		86	
Fruit and vegetables served at meals	69.0	78.9		79	
Fruit served for dessert	44.3	42.9		67	
High Home Availability (overall) ^b	74.6	81.7	p=0.241		
Home Accessibility					
Fruit available as a snack	66.7	69.4		71	
Vegetables available as a snack	58.6	65.7		67	
Cut up vegetables in the fridge	53.5	35.2		62	
Fresh fruit on the counter, table, or somewhere else where easily get to them	75.0	69.4		82	
High Home Accessibility (overall) ^b	64.4	72.3	p=0.283		
Parental Encouragement to eat FV					
Try to get me to eat more fruit	45.8	63.9		62	
Try to get me to eat more vegetables	48.6	68.1		77	
Buy fruits and vegetables they know I like	68.5	56.2		56	
High Parental Encouragement (overall) ^b	52.8	65.3	p=0.349		
Family Meals – regular (5+ times/week)	41.4	48.6		63	

^a Percentages refer to high response categories (3 or 4) versus low response (1 or 2) on a 4-point Likert scale (see methods section for response option categories).

^b Overall scales were dichotomized: Home Availability: 3-7 (low) vs 8-12 (high); Home Accessibility: 4-9 (low) vs 10-16 (high); Parental Encouragement to eat FV: 3-7 (low) vs 8-12. (high)

^c Percentage of Child-Parent Dyads differing by ≤ 1 step on a 4-point Likert Scale