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Television Viewing and Food Choice Patterns in a Sample of Predominantly Ethnic Minority Youth

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Abstract

Objective: To examine the cross-sectional and longitudinal relationships between television viewing and preferred food choices in a sample of ethnic minority, low income adolescents.

Methods: A sample of predominantly minority students (n=133) completed surveys at two time points, six months apart. Linear regression models examined television viewing and eating associations.

Results: Participants watched >3.5 hours/day of television, which is similar to the national average. Positive cross-sectional relationships existed between television viewing with fast food and sweetened beverage intakes at Time 1 and with snack food intake at both time points ($p<0.01$). The longitudinal association between change in snack food intake and change in average television hours/day approached significance after adjusting for baseline measure ($\beta=0.305$, $p=0.017$), as did the relationship with family meals ($\beta=-0.20$, $p=0.02$). No other longitudinal relationships were significant.

Conclusions and implications: If interventions reduced adolescents' television viewing time, such interventions could positively impact eating habits and thereby reduce adolescent's risk for obesity.

Keywords: Obesity; Sedentary behavior; African American; Latino

Introduction

Eleven to fourteen year olds watch 3+ hours of television daily [1] and are exposed to ~25,000 television advertisements annually [2]. It has been suggested that television viewing influences obesity risk because advertising disproportionately promotes high-calorie, low-nutrient food that lead to increased energy intake [3].

The higher rates of overweight in minority children [4] may be partially explained by their greater volume of television viewing as compared to white youth [1]. This increased exposure is potentially compounded in that more nutrient-poor food advertisements (i.e., fast food/candy/soda) appear during programs that target ethnic minorities than programs for the general public [5]. However, the longitudinal associations between screen time and snacking have not been fully examined in minority children.

This study examined cross-sectional and longitudinal relationships between television viewing and food choices/behaviors in a sample of minority, low-income adolescents. We hypothesize that minority youth who watch more hours of television will report poor eating habits. To our knowledge, no other published research has examined the prospective relationship between television viewing and food choices/behaviors in minority youth.

Methods

Participants

Data from predominantly Latino and African American 6th grade students who participated in the Community Steps to Minority Youth Fitness project [6] were used for the current study. This intervention substituted activity-focused physical education (PE) classes for usual, "stand-and-watch" PE, and provided brief nutrition lessons with healthy snacks. Intervention behavior change targets did not include efforts to change television viewing behavior, which is the focus of the current study. Students' PE instructors and parents provided consent and students provided assent. UCLA's Human Subjects Protection Committee provided IRB approval for study protocol. Students who completed follow-up surveys at 12 months (Time 1) and 18 months (Time 2) were included (n=198; mean age=11.5 years). Anyone (n=65) who had missing data at either time point for television viewing were excluded.

Measures

Television viewing, eating, and physical activity behaviors were assessed using a self-administered survey with questions patterned from the Youth Risk Behavior Survey [7]. Participants were asked about the number of hours spent watching television on a typical school day from 3 pm to 11 pm and on a typical weekend day. Food choice/behavior patterns were assessed from questions that inquired about how often over the past month did the participant eat/drink a variety of items, and ate breakfast and meals with family. Physical activity was defined by participation in at least 20 minutes of vigorous and at least 30 minutes of moderate intensity exercises.

Height and weight were measured by trained research staff. Body

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Mass Index (BMI) was calculated and BMI percentiles categories (average weight/overweight/obese) were defined using CDC age- and sex-adjusted growth chart [8,9]. Students self-reported sex, race/ethnicity, and school grades.

Data analysis

Descriptive statistics (frequencies, means) were calculated. The association between television viewing and food choice behaviors was examined using linear regression and evaluated at Time 1, Time 2, and the change between Time 1 and Time 2 (Time 2 minus Time 1 controlling for Time 1). Models were adjusted for sex, race/ethnicity, BMI, school grades, and physical activity. To control for multiple comparisons, a more conservative alpha level ($p<0.01$) was used.

List wise deletion of cases with missing values was employed in regressing outcomes of interest on television viewing, resulting in an analytical sample of n=114 for the cross-time analyses. Those cases that were dropped because of missing values on 1+ variables included in the regression models were not significantly different on any outcome measures except for baseline snack food intake, where subjects retained in the analysis reported less frequent snacking than subjects dropped from the analysis ($t(147)=2.04$, $p=0.044$). Cross-time regression of follow-up snacking on television viewing included baseline snacking as a covariate, partly to control for this difference. There were also proportionately more girls retained in the regression analyses than boys, consistent with the literature, so findings may be more pertinent to girls than boys ($t(225)=-2.48$, $p=0.014$).

Results and Discussion

The sample was majority female (61%) and primarily minority (56% Latino, 32% African American). At both time points, ~40% was overweight/obese and participated in ~4 days/week of moderate-to-vigorous physical activity. Few differences between Time 1 and Time 2 in television viewing and eating behaviors existed (Table 1). Fewer carrot and sweetened beverage servings were consumed at Time 2 than Time 1 ($p=0.004$ and $p<0.0001$, respectively).

There was a positive cross-sectional relationship between snack food intake and television viewing at both Time 1 and Time 2 ($p<0.01$; Table 2). The longitudinal association between change in snack food intake and change in average television hours/day approached significance ($\beta=0.305$, $p=0.017$). Fast food intake and sweetened beverage consumption were associated with television viewing at Time 1 ($p=0.01$ and $p<0.01$, respectively) and change in family meals with change in television viewing was approaching significance ($p=0.02$). No other relationships between television viewing and eating behavior were significant.

Significant cross-sectional associations between snack food intake and television viewing were found in this sample of predominantly Latino and African American middle school students. These associations were expected and similar results have been found in less ethnically diverse student populations [10]. Fast food intake and sweetened beverage consumption were associated with television viewing at Time 1, but other expected cross-sectional associations between eating behaviors and television viewing were not statistically significant in this sample. Numerous other studies [11-16] found an inverse relationship between healthful eating behaviors and television viewing in adolescents in different grade levels (i.e., elementary through college).

None of the longitudinal associations were significant, although the cross-time relationships between increased television viewing with increased snack food intake and decreased family meals did approach significance. Few studies have examined the relationship between diet and television viewing over time in adolescents [10,17], and both studies found a positive association between hours of television viewing and poorer food choices. Among middle schoolers, each hour increase in television viewing was associated with increased consumption of baked sweet snacks, candy, fast food, fried potatoes, salty snack foods,

	Time 1		Time 2		
	mean	SD	mean	SD	p-value[2]
Daily TV viewing (hours)					
Weekday	3.6	2.1	3.9	2.3	0.06
Weekend (Saturday)	4.3	2.4	4.1	2.4	0.37
Average/day	3.8	2.0	3.9	2.1	0.06
Dietary intake (daily servings)					
Fruit	1.70	1.7	1.49	1.5	0.12
Green salad	0.94	1.3	0.79	1.2	0.15
Potato[3]	0.76	1.1	0.61	1.0	0.16
Carrots	0.98	1.4	0.62	1.0	0.004
Other vegetables	1.05	1.4	1.18	1.5	0.35
Total fruits & vegetables[4]	4.70	4.3	4.09	4.0	0.05
Milk	1.44	1.7	1.09	1.4	0.02
Fast food	0.63	1.2	0.52	1.0	0.35
Snack food	1.31	1.4	1.33	1.5	0.87
Juice	1.91	1.8	1.50	1.6	0.03
Sweetened beverage	1.41	1.5	0.66	1.0	<0.0001
Number of family meals per week	1.65	1.7	1.69	1.7	0.82
Number of breakfast per week	4.62	2.7	4.59	2.7	0.92

[1]Estimates are unadjusted
[2]P-values generated from paired t-tests
[3]Potato servings exclude French fries, fried potatoes, and potato chips
[4]Total fruits & vegetable servings exclude potato servings

Table 1: Descriptive statistics for television viewing, food and beverage choice behaviors, and family meals.[1]

	Cross-sectional at Time 1			Cross-sectional at Time 2			Longitudinal		
Dietary intake (daily servings)	**β**	t	P	**β**	t	P	**β**	t	P
Fruit	-0.05	-0.68	0.50	0.0	1.72	0.09	-0.01	-0.12	0.90
Green salad	0.01	0.12	0.91	0.021	0.43	0.67	-0.11	-2.03	0.04
Potato[2]	0.01	0.14	0.89	0.04	1.13	0.26	-0.03	-0.45	0.66
Carrots	0.07	1.08	0.28	0.02	0.38	0.70	-0.08	-1.21	0.23
Other vegetables	0.01	0.13	0.89	-0.16	-0.26	0.80	0.08	1.14	0.26
Total vegetables[3]	0.03	0.17	0.87	0.12	0.76	0.45	-0.12	-0.75	0.46
Milk	0.03	0.35	0.73	-0.09	-0.86	0.39	-0.06	-0.87	0.39
Fast food	0.13	2.56	0.01	0.03	0.86	0.39	-0.10	-1.75	0.08
Snack food[4]	0.20	3.35	<0.01	0.26	4.35	<0.01	0.30	2.14	0.02
Juice	0.04	0.46	0.65	0.04	0.58	0.56	-0.12	-1.35	0.18
Sweetened beverage	0.20	2.93	<0.01	0.04	0.94	0.35	-0.39	-0.53	0.60
Family meals[5]	0.10	1.36	0.18	0.08	1.18	0.24	-0.20	-2.36	0.02
Breakfast[6]	0.23	1.91	0.06	0.07	0.61	0.54	-0.22	-1.50	0.14

[1]*t*-test and p-value from linear regression models (note: only p<0.01 was considered statistically significant to correct for the multiplicity of tests)
[2]Potato servings exclude French fries, fried potatoes, and potato chips
[3]Total fruits and vegetable servings exclude potato servings
[4]In cross-time analysis, baseline snacking was included as a covariate
[5]Data represent number of reported family meals per week
[6]Data represent reported number of times respondents eat breakfast per week

Table 2: Association between television viewing (hours/day) and food choice intake (servings/day) at Time 1, Time 2, and longitudinally (Time 2 - Time 1).[1]

and sweetened beverages [10]. High school students who watched 5+ hours of television while in middle school reported lower fruit intake and higher sweetened beverage consumption than those who watched less television [17]. Family meals are associated both cross-sectionally and longitudinally with better food choice intake and that watching television during dinner may have a negative influence on the quality of food choices [18]. Among middle and high school students who reported having at least three family meals/week, those students who reported often watching television during dinner had a higher intake of sweetened beverages and lower intakes of vegetables and grains than students who had regular family meals but did not watch television during mealtime [19]. The current study confirmed a positive, cross-sectional relationship between television viewing and poor food choices at each measurement point. However, longitudinal associations only approached significance, likely due to sample size and multiple comparisons. Due to social desirability, students may have underreported food intake of foods of minimum nutritional value, which may have hampered the relationship with television viewing.

Latino and African American youth have among the highest rates of obesity and report higher television viewing than white adolescents. Television viewing has been linked consistently with an increased risk for obesity. Future research should include intervention methods to decrease television viewing in this population and more longitudinal research examining mechanisms that could explain the relationship between adolescent obesity risk and television viewing.

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