Epidemic Obesity in the United States: Are Fast Foods and Television Viewing Contributing?

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ABSTRACT

Objectives. This study examined the association between TV viewing, fast food eating, and body mass index.

Methods. Associations between hours of TV viewing, frequency of eating at fast food restaurants, body mass index, and behaviors were assessed cross sectionally and longitudinally over 1 year in 1059 men and women.

Results. Fast food meals and TV viewing hours were positively associated with energy intake and body mass index in women but not in men. TV viewing predicted weight gain in high-income women.

Conclusions. Secular increases in fast food availability and access to televised entertainment may contribute to increasing obesity rates in the United States. (*Am J Public Health.* 1998;88:277–280)

Introduction

Obesity is an important public health problem that, in recent years, has reached epidemic proportions. The prevalence of obesity has increased gradually throughout this century, and it has risen sharply[1] in the last 10 years despite improvements in the quality of the American diet[2,3] and little change in energy expenditure from recreational physical activity.[4–6]

Two recent trends in the American lifestyle suggest themselves as possible contributors to recent trends in obesity: fast food consumption and passive entertainment through television. Between 1980 and 1990, the proportion of food dollars spent away from home showed a sharp upward trend, from 26% to 37%.[7] Substantial increases were also seen in the availability of televised entertainment via wide market penetration of home VCRs and cable television.[8] Increased availability of fast foods and televised entertainment could contribute to obesity by making eating more attractive and physical activity less so.

Previous research on the relationship between television viewing and body weight has shown positive associations cross sectionally and prospectively in both children[9–12] and adults,[13–16] although two studies in children did not find such an effect.[17,18] We are unaware of any studies that have specifically looked at fast food consumption and obesity. However, two studies of dietary correlates of obesity provide suggestive data in that frequency of consumption of two commonly eaten fast foods (i.e., French fries[19] and hot dogs[20]) was found to be associated with obesity and/or weight gain.

The present investigation was designed to further explore the relationship between fast food consumption, TV viewing, and body weight in adults. Data on TV viewing, frequency of eating at fast food restaurants, exercise, and diet were obtained for a large population of men and women, and these data were related cross sectionally to body mass index and prospectively to change in body mass index over a period of 1 year.

Methods

Data for this investigation were derived from baseline and first annual follow-up examinations of a longitudinal cohort of individuals participating in a weight gain prevention study. Participants were 198 men and 529 high-income women recruited through media advertisements and 332 low-income women recruited primarily through the special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Those included in the present analyses (1) were 20 to 45 years of age, (2) were in good health, (3) were not pregnant in the year prior to or following study enrollment, and 4) attended both baseline and follow-up examinations. Subsequent to baseline assessment, half of the participants were randomly assigned to one of two low-intensity intervention groups designed to reduce weight gain, and half were assigned to a no-contact control condition. The present study was unrelated to the purposes of the intervention trial and thus treated intervention assignment simply as a covariate in analyses.

Study Measures

Data on the following demographic variables were obtained: (1) age in years, (2) education (less than high school, some college, college degree or higher), (3) current marital status (married vs not married), and (4) ethnicity (White vs other ethnic identifications). Current smoking status was determined, and total energy intake per day and percentage of energy from fat were estimated through the 60-item Block Food Frequency Questionnaire developed by the National Cancer Institute.[21]

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TABLE 1—Characteristics of the Study Population at Baseline, by Participant Subgroup

	Men	High-Income Women	Low-Income Women
No.	198	529	332
Age, y, mean (SD)	35.3 (6.0)	36.9 (5.6)	31.4 (6.3)
Married, %	62	66	19
Education, %			
High school, or less	4	7	24
Some college	23	34	48
College degree or higher	73	59	28
Ethnicity, % White	97	94	79
Current smoker, %	14	9	31
Body mass index, kg/m^2, mean (SD)	27.8 (4.6)	25.9 (4.9)	27.7 (6.9)
Energy intake per day, kcal, mean (SD)	2168 (1104)	1441 (534)	1902 (1627)
Energy from fat, %, mean (SD)	33.8 (7.7)	33.3 (7.7)	35.3 (8.7)
Physical activity,[a] mean (SD)	49.0 (32.8)	45.6 (30.3)	48.6 (33.5)
Television, h/d, mean (SD)	1.9 (1.9)	1.8 (1.5)	3.1 (2.5)
Fast food, meals/wk, mean (SD)	2.2 (2.0)	1.5 (1.7)	1.7 (1.7)

[a]Computed as the sum of frequency per week of 12 activities multiplied by estimated intensity in metabolic equivalents for each activity.

Physical activity was measured via an adaptation of an instrument developed by Jacobs et al. for epidemiological studies.[22] The frequency with which each of 12 exercise activities was performed for 20 minutes or more over the previous year was assessed. A total exercise score was computed as the sum, across all 12 items, of the reported frequency per week for each activity multiplied by its estimated intensity in metabolic equivalents.

Fast food consumption was estimated with the question "About how many meals per week do you eat from 'fast food' restaurants?" TV viewing was assessed by asking "On an average day, how many hours of television do you watch?"

Weight was measured in light clothing without shoes on a calibrated balance beam scale. Height was measured with a wall-mounted ruler. Body mass index was computed as weight in kilograms divided by height in meters squared.

Analyses

Because weight gain with age differs by sex and, among women, by socioeconomic status, analyses were conducted separately for men, high-income women, and low-income women. The general linear modeling procedures of SAS were used. Bivariate associations were first computed assessing the relationship between fast food meals per week, hours of TV viewing, and diet and exercise variables. Next, multivariate analyses were conducted relating TV viewing and fast food eating with body mass index and change in body mass index over 1 year. A first set of analyses controlled for age, education, baseline smoking, and, for change in body mass index only, baseline body mass index and treatment group. A second set of analyses also controlled for energy intake, percentage of calories from fat, and physical activity. Because reported TV viewing and fast food eating were not significantly related to each other, results of analyses that modeled both variables simultaneously were very similar to those that treated them individually. Data described subsequently involved the latter approach.

Results

Eighty-six percent of participants entering the study completed the 1-year follow-up survey. Completion rates were slightly lower in low-income women (82%) than in high-income women (88%) and men (87%), but those who completed the follow-up survey did not differ in terms of baseline characteristics from those who did not. Table 1 presents descriptive information on the three groups of study participants. High-income women and men averaged about 35 years of age, were highly educated and mostly White, had low smoking rates, and had body mass indexes that were slightly higher than population averages. Low-income women in the study were younger, less likely to be married, less educated, heavier, and more likely to smoke.

Table 2 shows the bivariate associations between TV viewing hours, fast food meals, and diet and exercise variables. Table entries are unstandardized regression coefficients and their 95% confidence intervals. TV viewing was not related to energy or fat intake in men. It was, however, positively related to energy intake in both high- and low-income women and to percentage of energy from fat in low-income women. TV viewing was unrelated to reported exercise. Number of fast food meals eaten per week was positively associated with total energy intake and percentage of energy from fat in all three study groups. It was also negatively associated with exercise in low-income women.

Table 3 shows cross-sectional and longitudinal associations over 1 year between TV viewing, fast food eating, and body masss index. In men, none of these associations were significant. In women, fast food eating and TV viewing were both positively associated with body mass index. The relationships were strongest among low-income women. Controlling for demographic covariates had little effect on these relationships. Controlling for reported diet and exercise habits reduced the strength of the associations but did not eliminate them. The only longitudinal finding was a marginally significant positive relationship between hours of TV viewing and change in body mass index in high-income women.

Discussion

This study explored the hypothesis that TV viewing and fast food eating may contribute to obesity in the United States. The data for women were generally consistent with the hypotheses. Hours of TV viewing per day and meals eaten at fast food restaurants per week were both positively associated with body mass index cross sectionally. TV viewing also predicted weight gain in high-income women. The finding that energy intake and percentage of energy from fat were also positively associated with TV viewing and fast food eating

TABLE 2—Regression Coefficients Describing the Relationship between Hours of TV Viewing per Day, Meals per Week Eaten at Fast Food Restaurants, and Behavioral Variables

	Men		High-Income Women		Low-Income Women	
	Regression Coefficient[a]	95% Confidence Interval	Regression Coefficient[a]	95% Confidence Interval	Regression Coefficient[a]	95% Confidence Interval
			Hours of TV			
Calories per day	19	–63, 101	50	20, 80	136	68, 204
Percentage of fat	0.10	–0.47, 0.67	0.07	–0.36, 0.50	1.05	0.69, 1.40
Physical activity[b]	–2.14	–4.55, 0.27	–0.83	–2.54, 0.88	–0.51	–1.93, 0.91
			Fast food meals			
Calories per day	115	40, 190	69	43, 95	146	46, 246
Percentage of fat	1.21	0.70, 1.72	0.50	0.12, 0.88	0.64	0.10, 1.18
Physical activity[b]	–2.03	–4.28, 0.22	–0.91	–2.42, 0.64	–2.40	–4.46, –0.34

[a]Diet or exercise variable units associated with 1 hour of TV per day or one fast food meal per week.
[b]Computed as the sum of frequency per week of 12 activities multiplied by estimated intensity in metabolic equivalents for each activity.

would seem to strengthen the inference of causation by identifying a plausible intervening mechanism. The associations between TV viewing and obesity seen for women in this study are consistent with previous research in adults. The observation of a stronger link between TV viewing and obesity in low-income women is also consistent with the only previous study, in children, to examine the issue.[10] To the best of our knowledge, the findings relating fast food eating to weight are new, as are those showing that fast food eating and TV viewing are correlated with dietary intake.

Two negative findings in this study merit further comment. First is the lack of an association between TV viewing or fast food eating and body mass index in men. One possible explanation is that these men were a special group (i.e., volunteers for a study of weight gain prevention). Another is that the relationships between TV viewing, fast food eating, and weight are not the same in adult men and women, perhaps as a result of differences in occupational or social roles. The second negative finding meriting comment is the failure to find a relationship between exercise and TV viewing, even though exercise has typically been thought to be the mediating link between TV viewing and body weight.[23] One possible explanation for this apparent discrepancy is that the exercise measure used here, which assessed the frequency of exercises sustained for 20 or more minutes, may not have been sensitive enough to detect the

TABLE 3—Regression Coefficients Describing the Relationships between TV Viewing, Fast Food Eating, Body Mass Index (BMI), and 1-Year Change in BMI

	Men		High-Income Women		Low-Income Women	
	Regression Coefficient[a]	95% Confidence Interval	Regression Coefficient[a]	95% Confidence Interval	Regression Coefficient[a]	95% Confidence Interval
			Hours of TV			
BMI						
Model 1[b]	0.14	–0.20, 0.48	0.44	0.16, 0.72	0.76	0.48, 1.04
Model 2[c]	0.23	–0.12, 0.58	0.40	0.12, 0.68	0.70	0.39, 1.01
Model 3[d]	0.17	–0.17, 0.51	0.30	0.02, 0.58	0.59	0.27, 0.91
BMI change						
Model 1[b]	–0.07	–0.39, 0.25	0.08	0.0, 0.16	–0.01	–0.11, 0.09
Model 2[c]	–0.09	–0.43, 0.25	0.09	0.0, 0.18	0.04	–0.07, 0.15
Model 3[d]	–0.11	–0.45, 0.24	0.09	0.0, 0.17	0.07	–0.03, 0.11
			Fast food meals			
BMI						
Model 1[b]	0.11	–0.21, 0.43	0.50	0.38, 0.62	0.97	0.56, 1.38
Model 2[c]	0.19	–0.13, 0.51	0.54	0.30, 0.78	0.97	0.56, 1.38
Model 3[d]	–0.10	–0.43, 0.23	0.39	0.15, 0.64	0.85	0.43, 1.27
BMI change						
Model 1[b]	–0.21	–0.51, 0.08	0.02	–0.05, 0.09	–0.08	–0.23, 0.05
Model 2[c]	–0.21	–0.51, 0.10	0.02	–0.05, 0.09	–0.09	–0.23, 0.05
Model 3[d]	–0.23	–0.56, 0.11	0.02	–0.05, 0.09	–0.06	–0.20, 0.08

[a]BMI units or change in BMI units associated with 1 hour of TV per day or one fast food meal per week.
[b]Bivariate.
[c]Controlling for age, education, smoking, and, for BMI change only, baseline BMI and treatment group.
[d]Controlling for variables in model 2 and total calories, percentage of fat, and physical activity.

types of activities most likely to be affected by TV viewing (i.e., short bursts of relatively low-intensity activities such as working around the house). Another is that the relationship observed between TV viewing and body weight is, in fact, mediated by eating rather than exercise.

Strengths of the present investigation include a simultaneous examination of the associations between both fast food eating and TV viewing and body weight in a relatively large and diverse sample of adults. Generalizability is limited by the fact that the sample was composed of volunteers for a weight gain prevention study and thus is not representative of the general population. In addition, our measures of TV viewing and fast food consumption, while similar to those used by other investigators, were relatively unsophisticated and of unknown validity. The time interval covered by the prospective analyses was also fairly short. Nevertheless, the findings suggest that further study is warranted of how changes in population exposure to fast foods and TV may be related to secular trends in obesity prevalence in the United States. □

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