Associations between Watching TV during Family Meals and Dietary Intake Among Adolescents

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ABSTRACT

Objective: To examine associations between watching television during family meals and dietary intake among adolescents.

Design: Cross-sectional study using survey data from a diverse sample of adolescents.

Setting: Data were collected from a school-based survey during the 1998-1999 school year.

Participants: Middle and high school students (N = 4746) from 31 public schools in the Minneapolis-St. Paul area. Response rate was 81.5%.

Variables Measured: Intake of fruits, total vegetables, dark green/yellow vegetables, calcium-rich food, grains, soft drinks, fried food, snack food, calories, family meal frequency, and watching television during meals.

Analysis: General linear modeling comparing dietary intake across 3 groups.

Results: 33.5% of boys and 30.9% of girls reported watching television during family meals. Adolescents watching television were found to have lower intakes of vegetables, dark green/yellow vegetables, calcium-rich food, and grains and higher intakes of soft drinks compared to adolescents not watching television during meals. However, watching television during family meals was associated with a more healthful diet than not eating regular family meals.

Conclusions and Implications: Watching television during family meals was associated with poorer dietary quality among adolescents. Health care providers should work with families and adolescents to promote family meals, emphasizing turning the TV off at meals.

Key Words: family meal, television, adolescent, dietary intake

INTRODUCTION

The importance of family meals in adolescents’ lives has received recent attention. More frequent family meals are associated with improved dietary intake among adolescents, including higher intakes of grains, fruit, vegetables, vita-

mins, and minerals including calcium, folate, fiber, iron, and vitamins A, C, E, B₆, and B₁₂, as well as a decreased intake of soft drinks.¹⁻³ The frequency of family meals has been found to decrease throughout adolescence.¹⁻⁴⁻⁵ Research indicates a steady decline as children age, with 51% of 9-year-olds and 35% of 14-year-olds reporting eating family dinner every day.² In addition to varying frequency of participation in family meals among adolescents, the context in which family meals occur varies as well.¹⁻⁶⁻⁹ In some families, watching TV during meals is common practice, whereas in other families, watching TV during meals is rare.¹⁻⁶⁻⁹⁻¹⁰ A national sample of adolescents indicated that 64% of 11- to 18-year-olds had the TV on during meals.¹¹ An important question that has not been explored is whether watching TV during family meals diminishes the nutritional benefits of family meals.

Increased TV viewing has been associated with increased caloric intake and decreased diet quality among children and adolescents, including consuming higher-fat food and lower intakes of fruits and vegetables.¹²⁻¹⁴ Data from the Youth Risk Behavior Survey indicated adolescents
who reported watching more than 2 hours of TV per day were more likely to consume inadequate servings of fruits and vegetables compared to adolescents who reported 2 or fewer hours of TV viewing per day. Coon and colleagues looked at the relationship between watching TV at meals and dietary intake between fourth-, fifth-, and sixth-graders. The study found children from families with the TV on for 2 or more meals per day had lower intakes of nutrient-rich food and higher intakes of processed food and soft drinks compared to children whose families had the TV on less often during meals.

The present study expands on available research on TV viewing during family meals, looking at adolescents. Specifically, the current study addresses the question: is watching TV during family meals associated with adolescents’ dietary intake? The hypothesis was that watching TV during family meals would be associated with a poorer quality diet compared to eating family meals but not watching TV. A secondary question examined whether watching TV during family meals was associated with better dietary intake compared to not eating regular family meals. The hypothesis was that eating family meals while watching TV would be associated with a higher quality diet than not eating regular family meals.

**METHODS**

**Study Design**

Data for this study were drawn from Project Eating Among Teens (Project EAT), which was designed to assess socio-environmental, personal, and behavioral factors related to adolescent nutrition. Trained research staff administered the Project EAT survey and the Youth/Adolescent Questionnaire (YAQ; a food frequency survey) during physical education, health, and science classes. Data were collected during the 1998-1999 school year. Study procedures were approved by the University of Minnesota Human Subjects Committee and by the research boards of the participating school districts. Consent procedures were followed according to school policy, with passive consent used in some schools, and other schools requiring active consent. The response rate for participation was 81.5%. The Project EAT survey was guided by Social Cognitive Theory as well as focus groups conducted with adolescents. The survey was pretested by seventh and tenth graders and then further pilot-tested by 161 seventh and tenth graders over a 2-week interval. Additional details of the Project EAT study have been described previously.

**Study Sample**

The study sample included 4746 ethnically and socioeconomically diverse adolescents from 31 public middle and high schools throughout primarily urban school districts in the Minneapolis-St. Paul metropolitan area. The sample was equally divided by gender (50.2% boys, 49.8% girls), and the mean age was 14.9 years (range 11 to 18), with 34.3% in middle school and 65.7% in high school. The ethnic/racial backgrounds of participants were as follows: 48.5% white, 19.0% African American, 19.2% Asian American, 5.8% Hispanic, 3.5% Native American, and 4.0% mixed/other. Of the total sample, 88.6% (n = 4206) completed the YAQ. The final analytic sample consisted of 4064 participants because of missing data on key independent variables and reported caloric intakes outside the plausible range.

**Measures**

**Family meals.** The Project EAT survey assessed frequency of family meals with the question: “During the past seven days, how many times did all, or most, of your family living in your house eat a meal together?” (test-retest Spearman r = .74) Response categories were: never, 1-2 times, 3-4 times, 5-6 times, 7 times, or more than 7 times. Prior research has shown similar dietary intake for adolescents reporting no family meals or 1 or 2 family meals, but differences in intakes were seen for adolescents reporting more than 3 meals. Therefore, for the present analysis, frequency was dichotomized to 3 or more meals versus 2 or fewer meals eaten together per week.

**Television viewing.** Watching TV during meal times was assessed, using the Project EAT survey, with the question: “In my family, we often watch TV while eating dinner” (test-retest Spearman r = .65). Response categories were: strongly disagree, somewhat disagree, somewhat agree, or strongly agree. Responses were dichotomized for analysis (agree/disagree). Given that hours of TV viewing has been associated with dietary intake, total TV viewing time was adjusted for in the analysis. Total TV time was assessed by asking how many hours per day adolescents watched TV and videos in their free time on weekdays and weekends. Response categories for each were 0, ½ hour, 1 hour, 2 hours, 3 hours, 4 hours, or 5+ hours, and responses were used to calculate weekly hours of TV.

**Dietary intake.** Dietary intake was measured with the 149-item YAQ, which has been validated among adolescent populations. In the present analysis, daily servings of fruit, total vegetables, dark green/yellow vegetables, calcium-rich food, grains, soft drinks, fried food, and snack food as well as daily caloric intake were assessed. Fruit servings were summed from reported intake of fruit and fruit juices. Vegetable servings were summed from consumption of individual vegetables, mixed vegetables, tomato sauce, and coleslaw. Intakes of fried vegetables including french fries and intakes of potatoes were excluded from total vegetable servings (analyses with and without fried food and potatoes revealed virtually identical results). Dark green or yellow vegetables were analyzed separately, as dietary recommendations indicate at least one third of...
vegetables consumed should include dark green, yellow, or orange vegetables. Calcium-rich food included milk, chocolate milk, yogurt, cheese, cheeseburgers, pizza, macaroni and cheese, grilled cheese, ice cream, pudding, and milk shakes. Grains included cereals, breads, tortillas, pasta, rice, crackers, and pretzels. Soft drink servings included sweetened carbonated beverages, punch or lemonade, and fruit drinks (not 100% fruit juice). Participants with calorie intakes less than 400 kcal/day or greater than 7000 kcal/day were excluded from analysis, as these values are biologically implausible for habitual intake. Caloric exclusion criteria were similar to that used in other studies, with a slightly higher upper value, as it seemed possible that adolescents could be consuming over 5000 kcal/day.1

Sociodemographics. Gender, school level, race/ethnicity, and socioeconomic status (SES) were based on self-report. Adolescents were classified as middle school (grades 7 and 8) or high school (grades 9-12) students. Race/ethnicity was assessed with the question: "Do you think of yourself as (a) white, (b) black or African American, (c) Hispanic or Latino, (d) Asian American, (e) Hawaiian or Pacific Islander, or (f) American Indian or Native American?" Adolescents reporting more than one response were coded as mixed/other. Variables used to assess SES included parental education level, eligibility for public assistance, eligibility for free or reduced cost school meals, and parents’ employment status.16

Statistical Analysis

Three groups were created to describe family meals and TV watching: (1) adolescents eating regular family meals (3 or more family meals) who did not report watching television during meals; (2) adolescents eating regular family meals who reported watching television during meals; and (3) adolescents who did not report eating regular family meals (2 or fewer family meals). Continuous dependent variables (dietary intake) were adjusted for positive skewness using square root transformations.

General linear modeling was used to test the independent effect of the family meal group (no TV, with TV, and no family meals) on daily servings from each individual food group. Previous research has documented differences in consumption patterns related to sociodemographic variables and TV viewing; therefore analysis was run with and without adjustment for SES, school grade level, race/ethnicity, total weekly TV viewing (hours), and total daily caloric intake. Estimated mean intakes were squared to transform them back to original scale and are reported as median intakes. Analyses were conducted separately for boys and girls.

RESULTS

Family Meals and Television Watching

Approximately two-thirds (66.9%) of adolescents reported eating regular family meals, characterized by 3 or more family meals during the past week. Among adolescents reporting eating regular family meals, roughly one half reported watching TV during the family meal. Family meal patterns and TV watching were similar among boys and girls, although a slightly higher percentage of girls than boys reported not eating regular family meals (36.0% vs. 31.4%, P < .01).

Family meals and TV habits by sociodemographic characteristics are shown in Table 1. Middle school youth were most likely to report eating family meals without watching TV, whereas high school adolescents were most likely to report not eating regular family meals. Differences in family meals and TV watching were seen across race/ethnicity for boys and girls. White adolescents were the least likely to report eating regular family meals while watching TV, and African-American adolescents most often reported no regular family meals. In general, girls and boys from higher SES reported more family meals without TV, and adolescents from middle to low SES reported more family meals with TV.

Dietary Intake By Family Meals and Television Watching

In unadjusted analyses, boys reporting regular family meals without TV were found to have a higher quality diet than boys reporting watching TV during regular family meals (Table 2). After adjusting for sociodemographics, weekly hours spent watching TV, and caloric intake, boys eating family meals without TV were found to have more healthful diets with significantly greater intakes of total vegetables, dark green/yellow vegetables, grains, and lower intakes of soft drinks compared to boys eating family meals with TV. For example, boys eating family meals without TV reported an average of 1.4 daily servings of total vegetables compared to 1.2 daily servings among boys eating family meals while watching TV (P < .001). Differences in intakes of snack food, fried food, and total calories were not statistically significant between boys not watching TV and boys watching TV during family meals (Table 2).

In unadjusted analyses, adolescent girls reporting family meals without TV had significantly higher intakes of dark green/yellow vegetables and lower intakes of soft drinks, fried food, and snack food compared to adolescent girls reporting family meals with TV. Significant differences remained for dark green/yellow vegetables and fried food after adjusting for sociodemographics, weekly hours of TV, and caloric intake. For instance, girls watching TV during family meals had an average of 0.49 daily serving of snack foods compared to 0.54 daily servings among girls not watching TV during family meals (P < .001). Caloric intake among girls not watching TV during meals was not statistically different compared to girls watching TV (Table 3).

Comparisons in dietary intake between adolescents who reported regular family meals with TV and adolescents not
reporting regular family meals indicated that eating family meals with TV was associated with improved dietary quality. In adjusted analyses, adolescent boys and girls reporting family meals with TV were found to have higher intakes of total vegetables, calcium-rich food, and greater caloric intakes compared to boys and girls reporting no regular family meals. Girls reporting regular family meals with TV had higher intakes of fruit and grains and lower intakes of soft drinks and snack food than girls not reporting regular family meals (Table 3), but these differences were not seen among boys (Table 2).

Family meals without TV were also found to be associated with more healthful intakes compared to not eating regular family meals. In adjusted analyses, higher intakes of fruit, total vegetables, dark green/yellow vegetables, calcium-rich food, and grains, and lower intakes of soft drinks, fried food, and snack food were found among adolescent boys and girls reporting family meals without TV compared to boys and girls reporting no family meals (Tables 2 and 3).

**DISCUSSION**

This study explored associations between watching TV during family meals and dietary intake among adolescents. The data suggest adolescents watching TV during family meals are more likely to have a poorer quality diet compared to adolescents eating family meals without watching TV. Watching TV during family meals was associated with lower intakes of vegetables, grains, and dairy food, and higher intakes of soft drinks and fried food. Additionally, the results show that adolescents eating regular family meals while watching TV had better quality diets than adolescents not eating regular family meals.

These findings are consistent with previous research on family meals and TV viewing. Coon and colleagues found that younger children whose families ate 2 or more meals with the TV on consumed fewer servings of nutrient-rich food, including grains, fruit, green and yellow vegetables, beans, and nuts than children whose families ate meals with the TV on for one or fewer meals. Additionally, in agree-
ment with these findings, children from families with the TV frequently on during meals consumed more soft drinks than other children.9 A study by Boutelle et al focused on the family meal environment of middle and junior high school students and parental dietary intake and found parents reporting more frequent TV watching during family meals were more likely to report a greater intake of fat and lower intakes of fruits and vegetables.8 Associations between children’s intake and TV during family meals were not assessed in Boutelle’s study.

Current findings provide additional insight into the relationship between watching TV and dietary intake. One potential mechanism explaining the association between watching TV during meals and dietary intake is through the influence of advertising. Commercials and advertisements shown on TV often focus on food and beverage products promoting unhealthful food, potentially influencing food choices and eating patterns of adolescents and families.24,25 For instance, research has shown that among young children, food requests and recognition of products were correlated with advertisements seen on TV.26,27 Adolescents are not immune to advertisements or product placements in TV shows, and they have been found to be more likely to desire a particular item when favorite celebrities are depicted using the product.28 The finding that watching TV during family meals, even after controlling for overall hours spent watching TV, was associated with a lower quality diet compared to not watching TV provides evidence that exposure to TV during meals may have a role in eating habits of adolescents. Given this finding, health professionals, families, and adolescents should continue advocating for decreasing the number of TV commercials for low-nutrient food and increasing commercials for nutrient-dense food, including fruits and vegetables. Promoting and advertising healthful food on TV, while decreasing the number of ads for unhealthful food, has the potential to positively influence dietary intake among adolescents.

Table 2. Median Daily Servings from Food Groups by Family Meal Habits (Boys)

<table>
<thead>
<tr>
<th>Median Daily Servings</th>
<th>Unadjusted Analysis</th>
<th>Adjusted Analysis*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Family Meals, No TV</td>
<td>Family Meals, TV</td>
</tr>
<tr>
<td>Fruit</td>
<td>2.1†</td>
<td>1.9‡</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.4†</td>
<td>1.2‡</td>
</tr>
<tr>
<td>Dark green/yellow</td>
<td>0.44†</td>
<td>0.38‡</td>
</tr>
<tr>
<td>vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium-rich food</td>
<td>3.4†</td>
<td>3.2‡</td>
</tr>
<tr>
<td>Grains</td>
<td>6.0†</td>
<td>5.7</td>
</tr>
<tr>
<td>Soft drinks</td>
<td>1.1†</td>
<td>1.2‡</td>
</tr>
<tr>
<td>Fried food</td>
<td>0.49†</td>
<td>0.57‡</td>
</tr>
<tr>
<td>Snack food</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Calories</td>
<td>2293</td>
<td>2253</td>
</tr>
</tbody>
</table>

* adjusted for socioeconomic status, school level, race, weekly hours watching TV, caloric intake
†,‡,§ superscripts indicate statistically significant differences when different from each other, P = .05

Table 3. Median Daily Servings from Food Groups by Family Meal Habits (Girls)

<table>
<thead>
<tr>
<th>Median Daily Servings</th>
<th>Unadjusted Analysis</th>
<th>Adjusted Analysis*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Family Meals, No TV</td>
<td>Family Meals, TV</td>
</tr>
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<td>Fruit</td>
<td>2.2†</td>
<td>2.2†</td>
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<td>Vegetables</td>
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<tr>
<td>Calcium rich food</td>
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<td>2.7†</td>
</tr>
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<td>Grains</td>
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<td>5.6†</td>
</tr>
<tr>
<td>Soft drinks</td>
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<td>1.1‡</td>
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<tr>
<td>Fried food</td>
<td>0.44†</td>
<td>0.56‡</td>
</tr>
<tr>
<td>Snack food</td>
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<td>2.6‡</td>
</tr>
<tr>
<td>Calories</td>
<td>2030†</td>
<td>2157‡</td>
</tr>
</tbody>
</table>

* adjusted for socioeconomic status (SES), school level, race, weekly hours watching TV, caloric intake
†,‡,§ superscripts indicate statistically significant differences when different from each other, P = .05
with a lower quality diet than not watching TV during meals, findings also revealed that boys and girls watching TV during regular family meals are more likely to report a more healthful diet than adolescents who do not eat regular family meals. In general, when families eat together, parents have the opportunity to influence what is served at meals. Families who choose to eat together may be more likely to try to prepare well-balanced, nutritious meals compared to adolescents eating on their own who may rely on prepackaged convenience food for meals, often lacking in fruits and vegetables. Additionally, when families eat together less frequently, parents may not have the opportunity to observe their adolescents’ eating behaviors and may be unaware of dietary inadequacies. When the family eats together more frequently, even if the TV is on, parents can observe what their adolescent is consuming. Adolescent girls not participating in family meals were found to have significantly lower calorie intakes than girls eating family meals with or without watching TV. There was a similar trend among adolescent boys. One possible explanation for these findings is that adolescents not frequently participating in family meals may be at increased risk for engaging in chronic dieting, binge eating, and unhealthful weight control behaviors, including restricting behaviors. Adolescents not participating in family meals may also be more likely to underreport caloric intake and have greater difficulty accurately remembering portion sizes and food consumed than adolescents participating in family meals. Overall, study findings provide clear evidence for the role of the family meal in enhancing dietary quality among adolescents.

In some situations, it may be possible for TV to play a helpful role in increasing participation in family meals. Some adolescents cite a dissatisfaction with family relationships as a reason for not participating in family meals. Adolescents unhappy with family relationships may be more likely to participate in family meals if the TV is on and conversation isn’t the main focus. Therefore, it is possible that TV may be able to play the role of initially bringing families together for meals without causing additional strain on family relationships, but still allowing for nutritional benefits of family meals compared to not eating together.

This study has several strengths that enhance the ability to draw conclusions from the findings. The large, socioeconomically and ethnically diverse study sample enhances the ability to make generalizations to diverse adolescent populations. The study was also strengthened by the use of a comprehensive survey instrument to assess dietary habits of adolescents, including measures to assess both family meal patterns and TV viewing during meal times. Study limitations should be taken into account when interpreting results. All variables were assessed via self-report; therefore, the possibility of social desirability, recall, or response bias was introduced. While the YAQ is a widely used, validated tool for assessing dietary intake among adolescents, it is not without limitations. Potential limitations may arise when using the YAQ in an ethnically diverse population, with one study showing lower validity among African-American adolescents, which compose 19% of the study population. Finally, because of the cross-sectional and observational nature of the study, a causal relationship between family meals and dietary intake cannot be established.

**IMPLICATIONS**

Findings from the current study support results of previous studies suggesting that regular family meals are associated with improved dietary quality among adolescents. The findings revealed the most healthful diets, with highest intakes of fruits and vegetables and lowest intakes of soft drinks and fried food, were seen among adolescents eating family meals without watching TV. Yet, eating as a family, even with the TV on, appears to be beneficial, as adolescents reporting watching TV during regular family meals were found to have a more healthful diet compared to adolescents not eating regular family meals. Based on findings from the current study and previous studies, dietitians and other health care providers should make efforts to work with adolescents and families to increase the overall frequency of family meals. In working with families, practitioners should encourage turning the TV off as often as possible to maximize the benefits of the family meal.

**ACKNOWLEDGMENTS**

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**REFERENCES**


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