Electronic Media and Beverage Intake among US High School Students—2010

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INTRODUCTION
Adolescent Media Exposure

- TV, computers, video games

- TV is the most used form of media*

- Exposure may affect:
  - Overall diet quality
  - Specific dietary behaviors

Added Sugars

- Caloric sweeteners that are added to foods during processing or preparation, or that are consumed separately
  - Used to preserve foods and provide certain attributes
  - Supply calories but few or no nutrients and no dietary fiber
  - Contribute to 16% of total calories
  - Replace nutrient-dense foods and beverages and make it difficult for people to achieve recommended nutrient intake while controlling for calories
Dietary Guidelines - Added Sugars

- No more than about 5-15% of calories from added sugars AND solid fats can be reasonably accommodated in the USDA Food Patterns

- Recommendation: Reduce intake of calories from added sugars

- Adolescents who exceed maximum energy allowance
  - 70% of males
  - 80% of females
Sugar-sweetened beverages (SSBs)

- Largest single source of added sugars for adolescents
- Associated with:*
  - Excess caloric intake, poorer nutritional quality
  - Obesity
  - Lower bone mineral density
  - Anxiety, withdrawal
  - Poor quality or reduced sleep
  - Tooth decay
  - Risk factors for diabetes

- More healthful alternatives are water and low-fat or fat-free milk

Media Use and Weight Status

- Sedentary behaviors and SSB intake associated with weight status
- Mechanism for media use not firmly established
- Increased energy intake mediates between media use and obesity association
- Important to examine association between media use and SSB intake
Objectives

- This study expands upon previous studies by examining other media exposure variables

- Objectives
  - Describe electronic media exposure
  - Associations with beverage intake
METHODS
NYPANS Design

- National Youth Physical Activity and Nutrition Study conducted in Spring 2010
- Physical activity and dietary behaviors and determinants of these behaviors
- 3-stage cluster sample design
- Cross-sectional data representative of the US public and private school students in grades 9-12
- In each school, 1 or 2 classrooms per grade were randomly selected
NYPANS Questionnaire

- Anonymous, self-administered, and voluntary
- Local parental permission procedures were followed
- 120 items taking estimated 45 minutes
- Cognitive testing was performed
- Number of questions based on the Youth Risk Behavior Survey
NYPANS Response Rates

- School-level = 82%
- Student-level = 88%
- Overall = 73%

- Analytic variables were missing from ≤ 5% of questionnaires
Electronic Media Exposure

- **Video/computer games or used a computer**
  - ≥3 hours/day vs. <3 hours/day

- **Watched TV**
  - ≥3 hours/day vs. <3 hours/day

- **# TVs in the home**
  - ≥3 vs. <3

- **TV in the bedroom**
  - Yes vs. no

- **TV on while eating dinner at home**
  - Most of the time/always vs. Sometimes/rarely/never
Beverage Intake Questions

- **How many times during the past 7 days**
  - Regular soda or pop
  - Sports drinks
  - Energy drinks
  - Other SSBs
  - Plain water

- **How many glasses during the past 7 days**
  - Milk

- **Calculated as daily intake**
Beverage Intake Study Variables

- Summary variable created for SSBs
  - Regular soda or pop, sports drinks, energy drinks, other SSBs
  - ≥3 times per day vs. <3 times/day
  - Prevalence estimates of individual SSB items have been published*

- Water
  - ≥3 times/day vs. <3 times/day

- Milk
  - ≥2 glasses/day vs. <2 glasses/day

Data Analysis

- Data available from 11,429 students
- Weighting
  - To adjust for non-response and oversampling of black and Hispanic students
  - To provide national estimates
- SUDAAN used to account for complex sampling design
- Prevalence estimates for electronic media exposure
- Multivariable logistic regression to calculate prevalence ratios
  - Associations between electronic media exposure and beverage intake
  - Adjusted for sex, race/ethnicity, and grade
Electronic Media Exposure

- 23.5% used a computer or played video/computer games ≥3 hours/day
- 28.3% watched TV ≥3 hours/day
- 79.9% had ≥3 TVs in the home
- 70.2% had a TV in the bedroom
- 41.0% most of the time or always had a TV on while eating dinner
Media Exposure - Sex Differences

- **Male > Female**
  - Used a computer or played video/computer games (27.6% vs. 19.2%)
  - ≥3 TVs in the home (82.5% vs. 77.1%)
  - TV in the bedroom (75.3% vs. 65.0%)

- **Female > Male**
  - Watched TV ≥3 hours/day (30.2% vs. 26.4%)

- **No difference**
  - TV on while eating dinner
<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Black</th>
<th>Hispanic/Latino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used computers ≥3 hours/day</td>
<td>20.6%</td>
<td>31.5%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Watched TV ≥3 hours/day</td>
<td>20.6%</td>
<td>52.7%</td>
<td>33.7%</td>
</tr>
<tr>
<td>≥3 TVs in home</td>
<td>78.8%</td>
<td>86.1%</td>
<td>79.9%</td>
</tr>
<tr>
<td>TV in bedroom</td>
<td>66.0%</td>
<td>83.4%</td>
<td>75.9%</td>
</tr>
<tr>
<td>TV on while eating dinner</td>
<td>36.3%</td>
<td>62.0%</td>
<td>40.8%</td>
</tr>
</tbody>
</table>
Media Exposure - Grade Differences

- Only significant difference found was for watching TV ≥3 hours day

<table>
<thead>
<tr>
<th>Grade</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>28.7%</td>
</tr>
<tr>
<td>10</td>
<td>30.4%</td>
</tr>
<tr>
<td>11</td>
<td>24.7%</td>
</tr>
<tr>
<td>12</td>
<td>28.9%</td>
</tr>
</tbody>
</table>
# Associations with SSBs

<table>
<thead>
<tr>
<th>Activity</th>
<th>PR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used computers ≥3 hours/day</td>
<td>1.37 (1.21, 1.56)</td>
</tr>
<tr>
<td>Watched TV ≥3 hours/day</td>
<td>1.51 (1.34, 1.71)</td>
</tr>
<tr>
<td>≥3 TVs in home</td>
<td>1.25 (1.11, 1.41)</td>
</tr>
<tr>
<td>TV in bedroom</td>
<td>1.79 (1.54, 2.08)</td>
</tr>
<tr>
<td>TV on while eating dinner</td>
<td>1.43 (1.27, 1.60)</td>
</tr>
</tbody>
</table>

*Adjusted for sex, grade, race/ethnicity.*
## Associations with Water

<table>
<thead>
<tr>
<th></th>
<th>PR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used computers ≥3 hours/day</td>
<td>0.86 (0.78, 0.96)</td>
</tr>
<tr>
<td>Watched TV ≥3 hours/day</td>
<td>0.89 (0.83, 0.94)</td>
</tr>
<tr>
<td>≥3 TVs in home</td>
<td>0.95 (0.87, 1.04)</td>
</tr>
<tr>
<td>TV in bedroom</td>
<td>0.94 (0.88, 1.01)</td>
</tr>
<tr>
<td>TV on while eating dinner</td>
<td>0.80 (0.73, 0.87)</td>
</tr>
</tbody>
</table>

*Adjusted for sex, grade, race/ethnicity.
## Associations with Milk

<table>
<thead>
<tr>
<th>Behavior</th>
<th>PR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used computers ≥3 hours/day</td>
<td>0.83 (0.73, 0.94)</td>
</tr>
<tr>
<td>Watched TV ≥3 hours/day</td>
<td>0.83 (0.75, 0.93)</td>
</tr>
<tr>
<td>≥3 TVs in home</td>
<td>0.92 (0.82, 1.04)</td>
</tr>
<tr>
<td>TV in bedroom</td>
<td>0.74 (0.68, 0.81)</td>
</tr>
<tr>
<td>TV on while eating dinner</td>
<td>0.73 (0.65, 0.82)</td>
</tr>
</tbody>
</table>

*Adjusted for sex, grade, race/ethnicity.*
DISCUSSION
Previous Literature – Media Exposure

- Kaiser Family Foundation nationally representative study, 2008-2009

- Among 15-18 year olds
  - >4 hours watching TV
  - >1 hour on the computer
  - Approximately 1 hour playing video games

- Among 8-18 year olds
  - Black and Hispanic youth > white youth
  - 3.8 TVs in the home
  - 71% had TV in the bedroom
Previous Literature – Associations with Beverages

- Media exposure is associated with higher SSB intake
- SSB intake corresponds with decreased levels of water and milk intake
- Follows that media exposure would be associated with lower likelihoods of healthful dietary behaviors
Advertising and Marketing

- Marketers frequently target adolescents
- In 2006, >$1 billion spent on marketing food products to adolescents
- Most money was spent on carbonated beverages
- Advertising may influence food and beverage preferences, beliefs, purchases, and consumption
Other Mechanisms

- Modeling of beverage consumption in media
- Snacking during media use
- Mindless beverage consumption
Limitations

- Data is self-reported
- Data is cross-sectional
- Data apply only to youths who attend school
  - Not representative of all youths in this age group
  - 2009, among persons 16-17 years of age, approximately 4% were not enrolled in high school and had not completed
Strengths

- Large
- Multi-ethnic
- Nationally representative
- High exposure rate
- Examines a wide variety of media exposure variables
IMPLICATIONS
Implications for Research and Practice

- Parents should limit adolescent total entertainment media time to ≤2 hours/day*
- Media literacy education in schools can be helpful
- Changes in advertising content may be effective in changing beverage patterns
- Future research should evaluate interventions in this area

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For more information please contact Centers for Disease Control and Prevention

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Nutrient Dense Foods

- Positive health effects with relatively low calories
- Lean or low in solid fats
- Low or no added solid fats, sugars, starches, and sodium
- Examples
  - Vegetables and fruits
  - Whole grains
  - Seafood, lean meats, and poultry
  - Eggs
  - Beans and peas
  - Unsalted nuts and seeds
  - Fat-free and low-fat milk and milk products
Types of Added Sugars

- Corn syrup, corn syrup salads, high fructose corn syrup
- White sugar, brown sugar, raw sugar
- Malt syrup, maple syrup, pancake syrup
- Fructose sweetener, liquid fructose
- Honey, molasses
- Anhydrous dextrose, crystal dextrose
Other SSBs

- Lemonade
- Sweetened tea or coffee drinks
- Flavored milk
- Snapple
- Sunny Delight

- NOT including soda or pop, sports drinks, energy drinks, or 100% fruit juice
Beverage Response Options

- I did not drink [beverage] during the past 7 days
- 1-3 times during the past 7 days
- 4-6 times during the past 7 days
- 1 time per day
- 2 times per day
- 3 times per day
- ≥4 times per day