

**Research and Professional Briefs**

# Tween Sex Differences in Snacking Preferences during Television Viewing

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**ABSTRACT**

Television viewing is associated with an increased risk in childhood obesity. Research surrounding food habits of tweens largely bypasses snacking preferences while watching television in the home. The aim of this cross-sectional study was to describe snacking prevalence by tween sex and to describe parental rules surrounding snacking while watching television at home. Survey data were obtained in 2008 from 4th- through 6th-grade students (n=1,557) who attended 12 New England schools. Complete self-reported measures (n=1,448) included demographics, household and bedroom television ownership, television watching frequency, snacking prevalence, snacking preferences, and parental rules regarding snacking while watching television. Comparisons were generated using  $\chi^2$  analyses. Overall, the majority of children (69.2%) snacked “sometimes” or “always” during television viewing, with the majority of responses (62.9%) categorized as foods. The most popular food snacks for both sexes in this sample were salty snacks (47.9%), with fruits and vegetables ranking a distant second (18.4%). Girls (22.6%) selected fruits and vegetables more frequently than boys (14.7%) ( $P=0.003$ ). Of those drinking beverages (n=514), boys selected sugar-sweetened beverages more often than girls (43.5% vs 31.7%;  $P=0.006$ ), and girls chose juice more often than boys (12.3% vs 6.1%;  $P=0.02$ ). Overall, approximately half (53.2%) of the students consumed less-healthy snacks while watching tele-

vision. Interventions for parents and both sexes of tweens focusing on healthy snacking choices may have long-term beneficial outcomes.

*J Am Diet Assoc. 2011;111:1385-1390.*

Approximately one in three children in America are currently categorized as overweight or obese, with nearly half of those (17%) meeting criteria for childhood obesity (ie,  $\geq 95$ th percentile of body mass index) (1). Despite awareness of the childhood obesity epidemic, dietary quality of youth in the United States continues to decline (2-6). Adolescents consume more fat and sugars from snack foods and sugar-sweetened beverages than ever before (3-5), with increased snacking associated with increased intake (5). Reports suggest that nearly one quarter of adolescents' calories might be consumed by snacking (5). Although many Americans eat more energy than necessary (4), the prevalent foods consumed lack essential nutrients.

The home media environment, especially through television, may play a role in childhood obesity risk. Children spend an average of 3 to 4 hours watching television every day (7), which includes an average of 21 food or beverage advertisements, often promoting energy-dense, nutrient-poor options (8). It has also been found that children with televisions in their bedrooms are at higher risk for being overweight (9). At least one study suggests a relationship between the home media environment and eating behaviors. Barr-Anderson and colleagues (10) reported that adolescents with a bedroom television tended to have lower vegetable consumption (ie, females), lower fruit intake (ie, males), and all reported eating fewer family meals and drinking more sugar-sweetened beverages. Overall, youth exposure to television has been positively correlated with energy intake (11), including snacking (12-15) and meals (16-18), as well as fast-food consumption (19,20), and negatively associated with fruit, vegetable, and dairy consumption (10,11,19,21) and participation in family meals (10). In fact, the Institute of Medicine recently concluded that American youths are at high risk for being influenced by food marketing on television (22). Despite these concerns, research to date has not examined snacking patterns in preteens while watching television in the home environment.

Food preferences and dietary intake of youths have also been shown to differ by sex. Research suggests boys consume higher amounts of energy-dense fruits and vegetables (eg, fried potatoes) as compared to girls (2), adolescent boys drink more sugar-sweetened beverages and snack more often than girls (23), and that girls report a higher preference for vegetables (24). In line with this research, Caine-Bish and Scheule (25) found that of those

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*Manuscript accepted: March 24, 2011.*

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*0002-8223/ \$36.00*

*doi: 10.1016/j.jada.2011.06.004*

from grades 3 to 12, females tended to prefer fruits and vegetables in the school environment, while males preferred high-protein items, such as meat. Although differences between sexes in food habits of youths have been shown in the research mentioned previously, none to our knowledge have reported sex differences in snacking preferences while watching television of those in grades 4 to 6 while in the home environment. Tweens, who are “in between” childhood and adolescence, differ from younger and older youths physically, cognitively, and socially (26), which makes them a prime target for healthy behavioral interventions.

The aim of this research is to report the prevalence of tween snacking while watching television, as well as categorize the content of foods and beverages routinely consumed. Sex comparisons for both foods and beverages are described, which may be used in the future to better target healthy eating habits for tweens.

## **METHODS**

### **Study Design and Subjects**

Cross-sectional data in this study were collected from 4th-, 5th-, and 6th-grade students living in New Hampshire and Vermont from March to May 2008 to better understand the role that media plays in the nutritional and health habits of tweens by geographic location (eg, rural and urban), age, and sex. Fifteen public elementary and middle schools were selected by convenience sample to oversample rural schools in order to reflect the combined states' demographics. Classification of location was based on the US Department of Agriculture's Rural-Urban Continuum Codes, with eight rural schools rating 7 to 9 by county on the Rural-Urban Continuum Codes, and four urban schools rating 2 to 3 (27). Each school participating (n=12) was offered a \$250 stipend. All 4th-through 6th-graders enrolled in the schools were eligible for participation in the study. Parents were sent an advance letter that detailed the study and procedure and instructed them to call the school or principal investigator if they did not want their child to participate in the study. Three parents called or e-mailed to request more information about the study, but no parents declined consent. In addition to parental consent, students had the opportunity to decline participation (n=9). The paper-and-pencil surveys were administered to 1,557 students by our trained research staff in the classroom, and took approximately 45 minutes to complete. Students were offered token incentives (ie, water bottles, pens, pencils) following completion of the survey. The Committee for the Protection of Human Subjects at Dartmouth College approved the study.

### **Measures**

Media survey questions for this study were based on Brown and colleagues' *Teen Media* project for grades 7 and 8 (28,29). These questions were slightly modified to reflect updated television programming and media devices and to account for the younger age group using input from 10 focus groups conducted by our research team in 2007 from grades 4 through 6 from three middle schools in New Hampshire and Vermont (n=115). The

survey components addressed here include demographics, household and bedroom television ownership, and television watching frequency; snacking prevalence and frequency while viewing television; content of foods and beverages reported while viewing television; and parental rules surrounding snacking behaviors while watching television.

### **Demographics, Media Ownership, and Usage**

Tweens were asked, “What grade are you in?” to determine grade level. Self-identity of sex was established by having each tween indicate whether they were a boy or girl. For media ownership, tweens were asked the following open-ended question: “How many of these (eg, television with cable or satellite, television without cable or satellite) are in your house?” For bedrooms, respondents were asked, “Think of things you have in your own bedroom. How many of these are in your bedroom?” Responses were coded as mutually exclusive in the bedroom (ie, no, yes without cable/satellite, yes with cable/satellite). Frequency of television watching on school days was measured by asking students, “How many hours do you watch television on a normal school day?” Answers ranged from <1 to ≥5 hours daily. Based on the American Academy of Pediatrics recommendations (30), responses were collapsed to ≤2 hours and >2 hours daily for analyses.

### **Prevalence and Frequency of Snacking while Watching Television**

To measure prevalence and frequency of snacking, tweens responded to the statement, “I eat or snack while watching television.” The response categories were “Always,” “Sometimes,” “Almost Never,” or “Never.” Data were collapsed into a variable of “low” [Almost Never/ Never] and “high” [Sometimes/Always] snacking frequency for analyses.

### **Perceived Parental Rules Surrounding Snacking Behaviors during Television**

Parental rules were assessed using two statements: “My parents/guardians tell me when I can eat snacks at home,” and “I have to eat the snacks that my parents/guardians tell me.” Similarly, responses for both questions were “Always,” “Sometimes,” “Almost Never,” or “Never,” and were dichotomized into “low” [Almost Never/ Never] and “high” [Sometimes/Always] levels.

### **Food and Beverage Content of Snacking Preferences**

Tweens were asked food and beverage preferences with the following open-ended prompt: “Write 1 or 2 foods that you eat or drink most often while watching television.” The number of responses was recorded with a range from 0 to 2. To enable independence of observation assumptions and because some students (n=113) did not answer twice, only the first item was coded. Based on literature surrounding food and beverage categories of children and adolescents (31-34), items from the first list were organized initially by food or beverage. The first author (M.S.-M.) coded the responses as follows:

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