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Time 2 tlk 2nite: Youths' use of electronic media during family meals and associations with demographic characteristics, family characteristics and foods served

Jayne A. Fulkerson, PhD [Associate Professor],

School of Nursing, University of Minnesota, 5-160 Weaver-Densford Hall, 308 Harvard Street SE, Minneapolis, MN 55455; phone: 612-624-4823; fax: 612-626-6606

Katie Loth, PhD candidate, MPH, RD [Graduate Research Assistant],

Division of Epidemiology & Community Health, School of Public Health, University of Minnesota, 1300 South Second Street SE, Suite 300, Minneapolis, MN 55454; phone: 612-624-1818; fax: 612-624-0315

Meg Bruening, PhD, MPH, RD [Assistant Professor],

School of Nutrition and Health Promotion, Arizona State University, 500 N 3rd Street, Phoenix, AZ 85004; phone: 602-827-2266; fax: 602-827-2253

Jerica Berge, PhD, MPH, LMFT [Assistant Professor],

Department of Family & Community Health, School of Medicine, University of Minnesota, 717 Delaware Building Room 424, Minneapolis, MN 55455; phone: 612-626-3693; fax: 612-624-2466

Marla E. Eisenberg, ScD, MPH [Associate Professor], and

Division of Adolescent Health and Medicine, Department of Pediatrics, School of Medicine, University of Minnesota, 717 Delaware St. SE, Minneapolis, MN 55414; phone: 612-624-9462; fax: 612-2134

Dianne Neumark-Sztainer, PhD [Professor]

Division of Epidemiology & Community Health, School of Public Health, University of Minnesota, 1300 South Second Street SE, Suite 300, Minneapolis, MN 55454; phone: 612-624-0880; fax: 612-624-0315

Jayne A. Fulkerson: fulke001@umn.edu; Katie Loth: fall0075@umn.edu; Meg Bruening: meg.bruening@asu.edu; Jerica Berge: mohl0009@umn.edu; Marla E. Eisenberg: eisen012@umn.edu; Dianne Neumark-Sztainer: neuma011@umn.edu

Abstract

The study purpose was to examine the frequency of adolescents' use of electronic media (TV/ movie watching, text messaging, talking on the phone, listening to music with headphones and

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Correspondence to: Jayne A. Fulkerson, fulke001@umn.edu.

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playing with handheld games) at family meals and examine associations with demographic characteristics, rules about media use, family characteristics and the types of foods served at meals using an observational, cross-sectional design. Data were drawn from two coordinated, population-based studies of adolescents (EAT 2010) and their parents (Project F-EAT (Families and Eating Among Teens)). Surveys were completed in 2009–2010. Frequent TV/movie watching during family meals by youth was reported by 25.5% of parents. Multivariate logistic regression analyses indicated significantly higher odds of mealtime media use ($p < .05$) for girls and older teens. Additionally, higher odds of mealtime media use ($p < .05$) were also seen among those whose parents had low education levels or were black or Asian; having parental rules about media use significantly reduced these odds. Frequent mealtime media use was significantly associated with lower scores on family communication ($p < .05$) and scores indicating less importance placed on mealtimes ($p < .001$). Furthermore, frequent mealtime media use was associated with lower odds of serving green salad, fruit, vegetables, 100% juice and milk at meals whereas higher odds were seen for serving sugar-sweetened beverages ($p < .05$). The ubiquitous use of mealtime media by adolescents, differences by gender, race/ethnicity, age and parental rules suggest that supporting parents in their efforts to initiate and follow-through on setting mealtime media use rules may be an important public health strategy.

Keywords

family meals; media; healthful foods; adolescents; parents

Research has demonstrated that family meals promote healthful adolescent diets,^{1–4} emotional well-being,^{5,6} and fewer unhealthy weight-control behaviors.^{7–9} Family meals are also associated with important family characteristics such as making family meals a priority,¹⁰ general family functioning^{11,12} and communication.¹³ Research has shown that youth consume more unhealthful foods and beverages when eating meals in front of the television (TV),^{14–16} with possible associations with overweight status.^{16,17} Thus, the high prevalence of mealtime TV watching is concerning. Whereas studies have shown high prevalence rates of computer use, video game playing¹⁸ and texting¹⁹ among youth, their increasing rates over time,¹⁸ and the ubiquitous nature of mobile devices,^{18,19} little is known about the prevalence of electronic media use other than TV viewing among adolescents during family meals. Moreover, demographic characteristics such as gender (boys), age (11–14 year olds) and race/ethnicity (black and Hispanic)¹⁸ and few parental rules around media use^{20,21} have been shown to be associated with higher media use, but associations with mealtime media use have not been examined and may have implications for interventions. The present study addresses these gaps by assessing media use during family meals and extending the type of media investigated beyond TV to include handheld games, text messaging, talking on the phone, and listening to music with headphones. This study further examines associations between media use during family meals and adolescent and parent demographic characteristics, parental rules about mealtime media use, family mealtime characteristics and foods served at meals.

METHODS

Study Design and Participants

Data were drawn from two coordinated, population-based studies: EAT 2010 (Eating and Activity in Teens) was a population-based study of 2,793 adolescents, and Project F-EAT (Families and Eating and Activity Among Teens) was a study of parents (n=3,709) of the adolescents in EAT 2010. Adolescents and parents completed surveys in 2009–2010.^{22–24} All parents of adolescents in Project EAT 2010 were invited to participate in Project F-EAT. Parents received a mailed invitation, survey, consent form, two-dollar bill and a postage-paid envelope to participate. Parents could complete the survey by mail or phone interview (available in seven languages). The response rate of invitees was 77.6%. Most parents (78%) completed the survey by mail; all participants received a gift card. The University of Minnesota Institutional Review Board approved all study procedures. Additional details can be found elsewhere.^{11,25}

For the present study, only data from one parent for each adolescent were used (n=2281). In selecting one parent for inclusion, preference was given to parents who reported living with the adolescent most of the time when all else was equal and mothers since research indicates that women are more often in charge of the family meal environment.²⁶ In addition, the family meal questions assessed in the present study came after a skip pattern in the parent survey that allowed parents to check “we never eat family dinners” (n=423). Thus, the final analytic sample included 1,858 parents.

Measures

The Project F-EAT parent survey was designed to gather information on adolescents’ family and home environments with relevance to dietary intake, physical activity, and weight-related health.^{11,22–24} Survey items were drawn from a previous Project EAT parent survey,^{27,28} corresponding measures from the EAT 2010 student survey,²² and existing surveys from the scientific literature.^{18,26,28–32} The Project F-EAT parent survey underwent extensive pilot testing (i.e., expert reviews for face/content validity and cultural relevance, focus groups with economically- and racially-diverse adults) and test-retest reliability testing over a two-week period (Pearson product-moment correlations for continuous variables and Spearman correlations for rank-level response options).³³ Data regarding adolescent report of family functioning, family communication and demographic characteristics came from the EAT 2010 adolescent survey. EAT 2010 (Eating and Activity in Teens) was designed to examine dietary intake, physical activity, weight control behaviors, weight status and factors associated with these outcomes in adolescents.³⁴

Electronic media use at mealtimes was examined with five items in which parents reported the frequency with which their adolescent engaged in “watching TV or movies,” “playing with hand-held games,” “talking on the phone,” “text messaging,” or “listening to music with headphones” during family meals. Response options included ‘never or rarely,’ ‘sometimes,’ ‘usually,’ and ‘always’ (item test-retest correlations=0.61 to 0.75). *Frequent* use was defined as ‘usually’ or ‘always.’ A summary measure was also created, comparing adolescents who did not use any media devices frequently at family meals to those who used

at least one device frequently at family meals. *Rules regarding mealtime media use* was assessed with “Do you set limits (have rules, including no use) on your child’s media use (TV, cell phone, texting, etc.) at family meals?” (yes/no; test-retest $r=.87$).

Mealtime importance (or lack thereof) was assessed by parents regarding the importance of eating together (reverse scored), scheduling family meals, perceived difficulty of eating together, and expectations of children being home for dinner (reverse scored) using strongly disagree to strongly agree response options; lower scores reflect greater importance on mealtimes (two-week test-retest $r=0.72$). *Family communication* was assessed by adolescents with four items regarding feeling cared for and talking about problems with mother/father. Response options included ‘Not at all,’ ‘A little,’ ‘Somewhat,’ ‘Quite a bit,’ ‘Very much’. Two-week test-retest correlation was high ($r=0.81$) and reliability was acceptable ($\alpha=0.67$). *Family functioning* was assessed with six items from the general functioning scale of the Family Assessment Device^{30,35} regarding family member acceptance, decision making, getting along, expressing feelings, misunderstandings, and confiding in one another (strongly disagree to strongly agree), with high validity, test-retest reliability and internal consistency reliability,¹¹ (present study sample $\alpha=0.70$). Higher scores on family relationship scales reflect better communication/functioning. *Types of foods served at family dinner* assessed the frequency of serving green salad, vegetables other than potatoes, 100% fruit juice, fruit (not including juice), milk and sugar-sweetened beverages at dinner (never/rarely, sometimes, usually, always; individual item test–retest values ranged from $r=0.56$ to 0.85). For analysis, response options were combined to ‘never/rarely/sometimes’ and ‘usually/always’. *Fast food for family meals* was assessed with ‘During the past week, how many times was a family meal purchased from a fast-food restaurant and eaten together either at the restaurant or at home (pizza counts)?’ Response options ranged from ‘never’ to ‘three or more times during the past week’ (test–retest $r=0.43$). Adolescent demographic characteristics, including *grade level in school* (6th–8th grade or 9th–12th grade), *gender and age* were self-reported on the EAT 2010 adolescent survey.

The following demographic characteristics were reported by parents : education (high school education, some college, and college/advanced degree), household income (< \$20,000, \$20,000–49,999, and >\$50,000), work status (working full-time, working part-time, not working), marital status (married, not married), age (< 36 years old, 36–40, 41–46, and 47+) and race/ethnicity (white, black, Hispanic or Latino, Asian, or mixed/other).

Statistical Analysis

Chi-square analyses assessed bivariate associations between frequent mealtime media use and demographic characteristics. To test the strength of these associations, multivariate logistic regression (95% confidence intervals) was used to calculate the odds of adolescents’ frequent use of mealtime media (while entering demographic variables that were statistically significant for at least one outcome in the bivariate models; bivariate models not shown). A parallel set of models also included the variable assessing parent rule-setting around mealtime media use to assess its contribution. Logistic regression models were run separately for each type of media. Mean differences in family meal importance, family functioning and family communication by frequent mealtime media use were assessed with

general linear modeling (adjusted for demographic characteristics), using Cohen's *d* to calculate effect sizes.³⁶ Differences in the frequency of the types of foods served at meals by frequent mealtime media use were assessed with odds ratios (95% confidence intervals); all multivariate models accounted for demographic characteristics. All analyses were conducted with SAS statistical software (version 9.2, 2009, SAS Institute, Carey, NC).

RESULTS AND DISCUSSION

The average parent age was 41.5 years (*SD*=8.1). The majority of parents were female (91.7%), diverse in education (51.1% completed high school or less; 27.1% completed some college; and 21.8% had a college/advanced degree) and work status (46.2% employed full time; 17.1% employed part time; and 36.7% not working). High percentages of parents reported low household incomes (38.2% reported annual household income of <\$20,000; 38.5% reported \$20,000-\$49,999; and 23.3% reported >\$50,000) and ethnic/racial minority backgrounds (29.5% self-identified as black; 16.6% as Hispanic; 18.6% as Asian; 29.1% as white; and 6.2% as mixed/other). Sixty percent of parents were married. The average adolescent age was 14.9 years (*SD* = 2.0), 53.9% were girls, and 56.4% were in high school (9th–12th grade) while 43.6% were in middle school.

Approximately two-thirds (67%) of parents reported that their adolescents watched TV/movies during family meals at least sometimes, with 25.5% reporting frequent TV/movie watching during family meals. Texting, talking on the phone, listening to music with headphones and hand-held game playing by youth during family meals were reported by 28.4%, 25.5%, 22.2%, and 18.2% of parents, respectively, while their frequent use was less common (8.6%, 7.4%, 7.2%, and 5.3%, respectively). Setting limits on mealtime media use was reported by 72.8% of parents. Our findings indicate that TV viewing, texting, talking on the phone, listening to music with headphones and hand-held game playing by youth during meals are highly prevalent among some youth regardless of promotional efforts by national organizations to reduce TV viewing and other screen time behaviors among youth to less than two hours per day.³⁷ Furthermore, these behaviors do not appear to be solely an individual pastime—teens and their families are watching TV together during a time when they could be benefiting from interpersonal interactions.³⁴ Our findings show that following TV watching, adolescent text messaging during family meals is the next most common mealtime media activity. The ubiquitous nature of smart phones and the ability to text message and talk on the phone with one device increases the likelihood that these activities will increase and may interfere with family interactions at mealtimes.

Analyses of multivariate models indicate that the odds of frequent adolescent mealtime media use varied significantly by adolescent gender, grade level, household income, parent education level and parent race/ethnicity (Table 1). The odds of frequent mealtime media use were generally higher for girls than boys. Most mealtime media use was significantly higher for high school-aged youth compared to middle school-aged youth, except watching TV/movies and playing with hand-held games. Household income was significantly and inversely associated with adolescents frequently listening to music with headphones during family meals. Compared to parents with a college or advanced degree, parents with a high school education or less had significantly higher odds of reporting adolescent use of TV and

electronic game playing during family meals. Compared to white parents, black and Asian parents had significantly higher odds of reporting frequent adolescent media use such as hand-held games and listening to music with headphones during family meals. Given that previous studies have not assessed *mealtime* media use other than TV watching, we are only able to compare many of our findings to studies of *general* media use. The differences in mealtime media use by demographic characteristics parallel previous research findings that girls spend more time talking on the phone and texting than boys, youth with black parents have higher rates of total media exposure, and parental education is inversely associated with overall time spent viewing TV.^{18,19} These findings suggest that interventions should be tailored based on gender and cultural differences regarding the use of electronics, particularly during meals, while promoting the importance of family meals and reduced electronic use for overall adolescent health.¹⁸

When the variable regarding parental rules around mealtime media use was included in the regression models (not shown on tables), the overall patterns were the same for the demographic indicators (i.e., the same demographic characteristics were significantly associated with adolescents' mealtime media use), but the "rules" variable explained significant additional variance in the model. Specifically, not having parental rules significantly increased the odds of frequent adolescent TV watching (OR=3.4, CI=2.71–4.35), playing with hand-held games (OR=2.2, CI=1.41–3.42), talking on the phone (OR=2.5, CI=1.73–3.69), text messaging (OR=3.1, CI=2.15–4.35) and listening to music with headphones (OR=2.0, CI=1.33–2.91) during family meals. These findings are consistent with previous research of general media use and the importance of rules,^{18,20} and appear robust given that our analyses adjusted for the effects of demographic characteristics. Thus, parents may be prime change agents to reduce adolescent mealtime media use, and signify the importance of educating and supporting parents in their efforts to develop and follow through with rules to change unhealthy behaviors in their homes and increase social connectedness with their teens.

Parents whose adolescents did not frequently use media during family meals had significantly higher scores on family communication and scores reflecting a greater perceived importance of mealtimes (Table 2). Effect sizes indicate that although the associations are statistically significant, the relationships are small in magnitude, with the exception of meal importance which had a medium effect size. The present study did not find significant associations between frequent mealtime media use and family functioning, suggesting that mealtime distractions may be associated with communication flow but may not relate to deeper family functioning. Compared to families in which adolescents used at least one electronic device frequently during meals, families where adolescents did not frequently use media at family meals had significantly higher odds of serving green salad, vegetables, fruits, 100% fruit juice, and milk while having significantly lower odds of serving sugar-sweetened beverages and purchasing fast food for family meals (Table 3). These findings, in combination with the strong inverse association between frequent mealtime media use and perceptions of the importance of family meals suggest that in some families, family meals might be more carefully planned overall, with priority placed on mealtime as well as the types foods offered and the overall atmosphere (limited media use).

While many parents face challenges associated with facilitating family meals, including scheduling difficulties³⁸ and time scarcity,^{39,40} the present study findings support the idea of media-free family meals. Parents should be encouraged to provide healthful, electronic-free meals whenever possible.

The present study is limited by its cross-sectional design regarding family relationships, limiting statements of temporality; however, it does provide a snapshot of mealtime media use during a time when electronics are a large part of families' daily lives. The general question about rules for electronic media use and the conservative cut-off to define frequent media use preclude us from examining how rules may vary by electronic media type and limit our ability to fully evaluate all media use during meals. Also, the present study did not measure parental mealtime media use, which may parallel their children's use and be important if family meal benefits come from the whole family going "media free" at mealtimes.

CONCLUSIONS

The present study extends our understanding of adolescent mealtime media use beyond TV viewing to include handheld games, talking and texting on cell phones, and listening to music with headphones and suggests that adolescent mealtime media use is highly prevalent, particularly among girls, older adolescents, black youth and youth with parents with low education. Given national recommendations and efforts to limit screen time among youth and promote family meals, these findings are important and relevant to dietitians and other health care providers who work with youth and families to support healthy behaviors. Furthermore, the types of foods served at meals may be more healthful when electronic media is limited and dietitians should be key players in initiatives promoting family meals and raising consciousness regarding the risk of too much mealtime media use. Those working with youth and families are encouraged to ask parents about the frequency of family meals, foods and beverages being served and use of media during mealtimes. Establishing rules to eliminate electronic media during family meals at an early age, when TV is the primary concern, may facilitate consistent messages and follow-through on rules for other electronic devices as children mature.

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Table 1

Multivariate odds ratios (OR) of adolescents' frequent use (usually/always) of electronic media at family meals by adolescent and parent demographic characteristics (n=1858)

Demographic characteristic	Watch TV OR (CI)	Play with hand-held games OR (CI)	Talk on phone OR (CI)	Texting OR (CI)	Listen to music with headphones OR (CI)
Adolescent Gender					
Male (referent group is female)	1.0 (0.77-1.19)	2.0 (1.27-3.06)	0.6 (0.38-0.83)	0.5 (0.37-0.75)	0.5 (0.37-0.81)
Adolescent Grade Level					
9 th -12 th gradec (referent group is 6 th -8 th grade)	1.0 (0.82-1.28)	1.1 (0.71-1.73)	1.9 (1.28-2.90)	2.1 (1.42-3.02)	1.5 (1.02-2.24)
Annual Household Income					
<\$20,000	1.1 (0.78-1.64)	1.5 (0.60-3.63)	1.1 (0.56-2.26)	1.6 (0.85-2.92)	3.3 (1.42-7.61)
\$20,000-\$49,999 (referent group is <\$50,000)	1.0 (0.73-1.45)	1.6 (0.66-3.82)	1.4 (0.72-2.67)	1.4 (0.80-2.54)	2.8 (1.25-6.33)
Parent Education Level					
High school or less Completed partial college (referent group is college/advanced degree)	1.5 (1.03-2.11)	6.6 (1.92-22.5)	1.9 (1.00-3.65)	1.2 (0.72-2.16)	1.6 (0.79-3.17)
Parent Race/Ethnicity					
Black	1.3 (0.93-1.76)	3.2 (1.37-7.70)	2.5 (1.38-4.68)	1.4 (0.83-2.27)	2.8 (1.44-5.40)
Asian	1.2 (0.81-1.28)	3.4 (1.36-8.37)	1.7 (0.86-3.52)	0.9 (0.45-1.62)	2.4 (1.14-4.90)
Hispanic	1.0 (0.66-1.43)	1.7 (0.62-4.43)	1.4 (0.69-2.93)	1.2 (0.69-2.25)	1.3 (0.61-2.92)
Mixed/other (referent group is white)	1.3 (0.78-2.08)	2.8 (0.87-8.71)	2.1 (0.89-5.09)	1.4 (0.66-3.00)	2.1 (0.82-5.32)
Parent Marital Status					
Not Married (referent group is married)	1.2 (0.92-1.90)	1.0 (0.58-1.54)	1.3 (0.87-1.97)	1.1 (0.78-1.65)	0.8 (0.54-1.22)

Note: Models were tested separately for each type of electronic media. All demographic characteristics listed on table were entered into each model simultaneously.

Table 2

Adjusted mean differences^a in family characteristics by adolescents use of electronic media (across types) at family meals (n=1858)

	Scale range	Frequency of media devices at family meals			Cohen's <i>d</i> ^b
		No frequent media use (n=1260)	Frequent use of one or more media devices (n=598)	F value	
		Mean (SD)	Mean (SD)		
Family characteristics					
Meal importance ^c	4–16	8.3 (2.8)	9.1 (2.7)	34.95	<.0001
Family functioning	6–24	18.2 (4.4)	18.0 (4.1)	1.06	.302
Family communication	4–20	15.0 (4.4)	14.6 (4.2)	6.52	.011

^a All models adjusted for adolescent gender, adolescent age, parent race/ethnicity, parent education and household income.

^b Effect size estimate between no frequent media use and at least one frequently used media device

^c Lower scores reflect higher levels of meal importance.

Multivariate^a odds ratios (OR) of foods served at family dinner comparing adolescents who do not frequently use media at family meals to adolescents who frequently use (usually/always) electronic media (across types) at family meals (n=1858)^b

Table 3

	No frequent media use at family meals
Foods served at family dinner	OR (95% CI)
Green salad at dinner (usually/always)	1.75 (1.37–2.70)
Vegetables at dinner (usually/always)	1.24 (1.02–1.50)
Fruits at dinner (usually/always)	1.77 (1.40–2.24)
100% fruit juice at dinner (usually/always)	1.50 (1.19–1.96)
Milk at dinner (usually/always)	1.55 (1.25–1.93)
Sugar-sweetened beverage at dinner (usually/always)	0.41 (0.32–0.53)
Fast food purchased for family meals (> once in past week)	0.70 (0.55–0.89)

^a All models adjusted for adolescent gender, adolescent age, parent race/ethnicity, parent education and household income.

^b Referent group is adolescents who use one or more media devices frequently at family meals