



Published in final edited form as:

Am J Health Behav. 2012 November ; 36(6): 786–796. doi:10.5993/AJHB.36.6.6.

Work Hours and Perceived Time Barriers to Healthful Eating Among Young Adults

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Abstract

Objective—To describe time-related beliefs and behaviors regarding healthful eating, indicators of dietary intake, and their associations with the number of weekly hours of paid work among young adults.

Methods—Population-based study in a diverse cohort (N=2287).

Results—Working > 40 hours per week was associated with time-related barriers to healthful eating most persistently among young adult men. Associations were found among females working both part-time and > 40 hours per week with both time-related barriers and dietary intake.

Conclusions—Findings indicate that intervention strategies, ideally those addressing time burden, are needed to promote healthful eating among young, working adults.

Keywords

young adults; work hours; meal behaviors; time factors

INTRODUCTION

Despite the benefits of healthful eating, many adults do not regularly engage in such behaviors, particularly young adults (ie, aged 20 to 31).¹ For example, national data show that young adults consume far below the recommended daily servings of fruits and vegetables and have high levels of fast food intake compared to other age-groups.^{2,3} Cost barriers, stress, limited knowledge of how to prepare healthy foods, and taste preferences have been identified as barriers to healthful eating among young adults, including both college students⁴ and nonstudents.⁵ However, the most frequently reported barrier to

healthful eating is lack of time,^{5–8} with young adults citing challenges in balancing work, school, and leisure schedules.⁶ Such time constraints may have consequences for weight gain and obesity. Perceived lack of time for healthful eating is named as a common reason for eating fast food⁹ and convenience foods (takeaway or prepackaged)^{6,9} and has been found to be associated with lower fruit and vegetable and greater fast food consumption.¹⁰ Further, “eating on the run” is associated with poor dietary intake, including higher intake of fast foods and soft drinks¹¹ and lower intake of vegetables.¹² Inconsistent meal patterns, particularly skipping breakfast, are associated with poorer diet quality and higher body weight and may also prevent weight maintenance.^{13,14}

Although a perceived lack of time has been identified as a common barrier to healthful eating, little research has explored the factors contributing to the feeling of such time pressure. In a study of young adult women, long hours of work or study¹⁰ were the most commonly reported cause of time pressure. Similarly, in a mixed-gender sample, irregular work hours were the most frequently reported cause of time pressure, but was mentioned more often by men than women.⁸ The actual number of hours that young adults worked for pay was not assessed in either study. Those of younger age (ie, up to age 34) and higher educational status (ie, college degree) are also more likely to perceive lack of time as being a barrier to healthful eating.¹⁵

Hours spent at work may indeed be detrimental to engagement in healthful dietary practices. Working long hours constrains time available, potentially influencing the amount of time that can be spent in alternative ways (eg, cooking, shopping for food).^{16,17} Working long hours also consumes mental resources; hours of overtime work have been associated with difficulty to psychologically disengage and ability to relax after work.¹⁸ Further, reported energy level after work has been found to decrease with increasing hours of work,¹⁹ which could have an important impact on evening food preparation. Food-related behaviors, such as planning meals and cooking meals in advance, are associated with healthier dietary intake,¹² yet planning and preparing healthful meals require investment of time and resources that may be easily disrupted by work-related factors. Accordingly, associations have been found between long hours of work and higher consumption of energy, sugar, and fat^{20,21} and increased use of convenience foods and eating out.²²

Little research has investigated the impact of work hours on perceived lack of time to eat healthfully and related beliefs and behaviors among young adults. Although individual definitions of healthful food choices vary,²³ research suggests that healthful eating is perceived to include intake of fruits and vegetables and limited fat and/or sugar intake.^{23–25} Understanding the contribution of work hours to perception of time available for healthful eating is important so that dietary recommendations, educational messaging, and weight management programs (eg, worksite programs) can address the influence of this potential work stressor (ie, long work hours). The aims of the current study in a population-based cohort of young adults were to (1) describe the prevalence of various time-related beliefs and behaviors regarding healthful eating and (2) examine associations between these beliefs and behaviors with hours of paid work per week. Associations were also examined between work hours and both fruit and vegetable intake and fast food consumption, in order to understand the impact of work hours on indicators of healthful and unhealthy eating behaviors among young adults.

METHODS

Study Design and Participants

Data for this cross-sectional analysis were drawn from Project EAT-III (Eating and Activity in Teens and Young Adults), the third wave of a population-based study designed to

examine dietary intake, physical activity, weight control behaviors, weight status, and factors associated with these outcomes among young adults. At baseline (1998–1999), a total of 4746 junior and senior high school students at 31 public schools in the Minneapolis/St. Paul metropolitan area of Minnesota completed surveys and anthropometric measures.^{26,27} Ten years later (2008–2009), original participants were mailed letters inviting them to complete online or paper versions of the Project EAT-III survey and a food frequency questionnaire (FFQ). A total of 1030 men and 1257 women completed the Project EAT-III survey, representing 66.4% of participants who could be contacted (48.2% of the original school-based sample). One third of participants (31%) were aged 20 to 25 years, and 2 thirds (69%) were aged 26–31 years. All study protocols were approved by the University of Minnesota Institutional Review Board. Additional details of the study design have been reported elsewhere.²⁸

Measures

The current study used items from the Project EAT-III survey and the FFQ. The Project EAT-III survey was developed with guidance from 3 formative focus groups conducted with an ethnically/racially diverse sample of males and females aged 25 to 30 years. The discussions focused on physical activity; eating and weight control behaviors; and related influences from the home, neighborhood, and workplace environments. Items for the EAT-III survey were pilot tested with a separate group of 27 young adults to gather feedback regarding survey topic areas, item wording, and survey administration procedures. A full description of the survey development process for Project EAT-III survey can be found elsewhere.²⁸

Time-related beliefs and behaviors regarding healthful eating—Beliefs and behaviors were assessed with 8 items on the EAT-III survey. Participants reported extent of agreement with the following statements: “I am too busy to eat healthy foods”, “I am too rushed in the morning to eat a healthy breakfast”; “I don’t have time to think about eating healthy”; “Eating healthy meals just takes too much time”; “It is hard to find time to sit down and eat a meal”; “I tend to “eat on the run””; “Regular meals are important to me”; and “I eat meals at about the same time every day.” Response options, ranging from 1 to 4, were strongly disagree [1], somewhat disagree, somewhat agree, and strongly agree [4]. For analysis purposes, responses were dichotomized into strongly/somewhat disagree vs strongly/somewhat agree.

Fast food intake—Fast food intake was assessed with one item on the EAT-III survey: “In the past week, how often did you eat something from a fast-food restaurant (eg, McDonald’s, Burger King, Hardee’s)?”²⁹ The item had 6 response categories ranging from never to more than 7 times. For analysis purposes, responses were dichotomized into “less than once per week” and “one or more times per week.”

Fruit and vegetable intake—A semiquantitative FFQ was administered at the same time as the Project EAT-III survey to assess usual past-year intake of fruit and vegetables.³⁰ A daily serving was defined as the equivalent of ½ cup of fruits or vegetables (excluding potatoes). For analysis purposes, total number of reported fruits and vegetables was summed and dichotomized into “≥ 5 servings per day” or “< 5 servings per day.” This serving amount was selected to be in accordance with dietary recommendations (though this may generally vary by level of physical activity and caloric needs).³¹

Work hours—The number of weekly hours young adults worked for pay was self-reported on the EAT-III survey. Response options were 0, 1 – 9, 10 – 19, 20 – 29, 30 – 39, 40, and more than 40 hours per week. For analysis purposes, response categories were collapsed into

0, 1 – 19, 20 – 39, 40, and more than 40 hours per week. These categories were chosen due to the distribution of the work hour variable and to represent the range of part-time hours common among young adults.³²

Socio-demographics—Student status, educational achievement, age, and living arrangement (living with spouse/partner, living with child) were self-reported on the EAT-III survey whereas ethnicity/race was based on self-report at baseline. *Student status* was categorized as not a student, part-time student (community/technical college or 4-year college), full-time student (community/technical college or 4-year college) and graduate student (full- or part-time). *Educational achievement* was based upon the highest level of education participants reported completing, categorized as up to high school graduate/GED, vocational/associate degree, or bachelor's degree or higher. Two variables, Living with partner/spouse and Living with children, were created from participant report of whom they lived with the majority of the time over the past year (live alone, parents, roommates/friends, husband/wife, partner of same sex, partner of opposite sex, children, brothers/sisters, other). Participants were categorized as living with their partner/spouse if they selected husband/wife, partner of the opposite sex, or partner of the same sex. Participants were categorized as living with their children if they selected this response category. Ethnicity/race was categorized as white, black/African American, Asian or Other (Hispanic, Native American, mixed race).

Data Analysis

Cross-tabulations were conducted to describe the socio-demographic characteristics of the full sample by hours worked per week. Responses to the beliefs, behaviors, and dietary intake (fast food, fruit and vegetables) items were compared between males and females with χ^2 tests. As such dietary behaviors have been found to vary by gender,^{11,33} gender-stratified multivariate logistic regression analyses were conducted to examine associations between work hours and the beliefs, behaviors, and dietary intake outcomes, using 40 hours per week as the reference category. The models were adjusted for education, age, ethnicity/race, student status, living with spouse/partner, and living with children. A significance level of $P < .05$ was used to interpret statistical significance of regression coefficients. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) package version 16 (SPSS for Windows, Rel. 16.0.1. 2007. Chicago: SPSS, Inc).

Because attrition from the baseline sample did not occur at random, in all analyses, the data were weighted using the response propensity method.³⁴ Response propensities (ie, the probability of responding to the Project EAT-III survey) were estimated using a logistic regression of response at Time 3 on a large number of predictor variables from the Project EAT-I survey. The weights were inversely proportional to the predicted probability of response. Additionally, weights were calibrated so that the weighted total sample sizes used in analyses accurately reflect the actual observed sample sizes for men and women. The weighting method resulted in estimates representative of the demographic makeup of the original school-based sample, thereby allowing results to be more fully generalizable to the population of young people in the Minneapolis/St. Paul metropolitan area. Specifically, the weighted sample was 48.4% white, 18.6% African American, 19.6% Asian, 5.9% Hispanic, 3.3% Native American, and 4.2% mixed or other race/ethnicity.

RESULTS

Hours of Work by Participant Demographics

The majority (79%) of the sample worked 20 or more hours per week: 25% worked 20 – 39 hours, 33% worked 40 hours, and 21% reported working more than 40 hours per week.

Variations were observed across work hours for all socio-demographic variables (Table 1). Nearly one quarter of males worked more than 40 hours per week, whereas close to a third of females worked 40 hours per week. Over half of the white participants reported working 40 or more hours per week, whereas participants in the other racial/ethnic groups primarily reported working 20 to 40 hours per week. Participants with college degrees or higher were concentrated in the 40 and more-than-40 hours per week categories, whereas those with up to high school education tended to work fewer hours. Full-time students primarily worked fewer than 40 hours per week, whereas roughly one quarter of both graduate students and nonstudents worked more than 40 hours per week. Of those living with children, approximately 15% worked 0 hours per week and 28% worked 20 – 39 hours per week.

Time-related Beliefs and Behaviors Regarding Healthful Eating and Dietary Intake Among Young Adults

Table 2 presents comparisons by gender (unadjusted) of beliefs, behaviors, and dietary intake. Over half of both young adult men and women reported eating on the run. Similarly, half of the respondents reported being too rushed in the morning to eat a healthful breakfast. Moreover, more than one third of young adults reported they were too busy to eat healthful foods, eating healthfully took too much time, and it was hard to find time to sit down and eat a meal. However, a large majority (nearly 80%) of both males and females reported that regular meals were important to them, and well over half (60%) reported eating meals at about the same time each day. Close to 80% of males and 70% of females reported eating something from a fast food restaurant one or more times during the past week, whereas only one third reported eating 5 or more daily servings of fruit and vegetables. Gender differences existed in time-related beliefs and behaviors regarding healthful eating. Compared to males, significantly more females believed that eating healthful meals took too much time and that it was difficult to find time to sit down and eat a meal, yet more females valued the importance of regular meals than males. Finally, a greater percentage of females consumed at least 5 daily servings of fruit and vegetables, whereas significantly more males reported consuming fast food one or more times during the past week.

Beliefs and Behaviors and Dietary Intake by Hours Worked Per Week

Work hours were associated with beliefs and behaviors differently between genders. After adjustment for covariates (ie, age, education, ethnicity/race, student status, living with partner/spouse, living with children), working more than 40 hours per week was significantly associated with all but 2 of the beliefs and behaviors among males (Table 3). For example, compared to those working 40 hours per week, males working over 40 hours per week were more likely to report that eating healthfully takes too much time and that they were too rushed in the morning to eat a healthy breakfast. Number of hours worked per week was not associated with the perception of having time to think about eating healthfully, eating on the run in young adult men, fast food intake, or fruit and vegetable consumption.

In contrast, among young adult women, beliefs and behaviors were significantly associated with working both 20 – 39 hours per week and greater than 40 hours per week (after adjustment for socio-demographic variables; Table 4). For example, females working more than 40 hours per week were more likely to report not having time to think about eating healthfully and eating on the run; those working 20 – 39 hours per week were more likely to report being too busy to eat healthfully. Similar to young adult males, for females, work hours were not associated with fast food intake; however, females working 20–39 hours per week were more likely to report consuming 5 or more daily servings of fruit and vegetables.

DISCUSSION

The purpose of this study was to describe time-related beliefs and behaviors related to healthful eating and their associations with the number of weekly hours worked for pay among young adults; additionally, associations between work hours and measures of dietary intake were examined. High numbers of young adult men and women reported time-related beliefs and behaviors, such as being too rushed for breakfast, eating on the run, and perceiving that they did not have time to eat healthfully. Further, a large majority reported eating at fast food restaurants weekly and low consumption of daily servings of fruits and vegetables. Working more than 40 hours per week was consistently associated with less healthful eating beliefs and behaviors among young adult men, whereas associations among women were less consistent. Young adult women working both long hours (> 40 hours) or longer part-time hours (20 – 39 hours) experienced time barriers to healthful eating, though part-time work hours had a positive impact on fruit and vegetable consumption. These results add to the sparse literature of the potential impact of working hours on time burden and healthful beliefs and behaviors among young adults.

Long work hours (> 40 hours per week) were associated with a greater number of time-related beliefs and behaviors regarding healthful eating in young adult men, including being too busy to eat healthfully, being too rushed in the morning to eat a healthful breakfast, finding it hard to find the time to sit down and eat a meal, and perceiving eating healthfully took too much time. Associations were not found in these items among young adult women working more than 40 hours per week. These findings are generally consistent with previous research; long work hours have been associated with paying little attention to nutritional balance, irregular meals,³⁵ and late dinners³⁶ among adult male workers. Further, associations between long work hours and obesity have been previously found among men and not women,³⁷ and irregular work hours were reported more frequently in men than women as a barrier to healthful eating.⁸ It may be aspects of the job other than simply long working hours that may lead young women to feel less time is available to eat healthfully³⁸; inflexible hours at work/study and unpredictable hours at work/study have also been commonly reported as contributing to time barriers to eat healthfully in other studies.¹⁰ In addition, other factors in the lives of young adult women may be more detrimental to attitudes with regard to healthful eating. Other frequently mentioned contributors to time barriers to eating healthfully among women include commitments to children,^{5,9,10,39} other family, and friends/relatives.¹⁰ In our sample, over 20% of females reported living with children compared to just 10% of young adult males.

Interestingly, among young women in our study, working over 40 hours per week was not consistently associated with time-related eating beliefs and behaviors, whereas working longer, part-time hours showed unique associations. Specifically, females working 20–39 hours per week were more likely to feel too busy to eat healthfully and more likely to report eating on the run than were those working 40 hours per week. These associations may be due to the structure of part-time work⁴⁰; that is, these young women may be working more than one job, working at a job with a nontraditional schedule, or have limited schedule flexibility, making it difficult to eat regularly. Such working conditions may negatively impact one's ability to make healthful food choices and eat regular meals.^{38,41} Further, women are more likely than men to hold more than one job⁴² and to be employed in occupations requiring nonstandard hours,⁴³ possibly contributing to the lack of association in males who worked 20–39 hours per week. The addition of child care to part-time work may have been relevant in our sample as over 25% of young women working 20 – 39 hours per week reported living with children, compared with just 7% of young men. Finally young women continue to assume greater responsibility than young men for doing housework and

managing the home despite the number of hours worked per week,⁴⁴ which may impact their attitudes and behaviors related to healthful eating.

In contrast to the beliefs and behaviors items, work hours largely were not associated with actual food intake. Weekly fast food consumption remained relatively high for both males and females regardless of the number of hours worked per week. Further, among males, fruit and vegetable consumption remained consistently low across all work-hour categories. Young adult women working 20 – 39 hours per week, however, were most likely to report consuming 5 or more daily servings of fruits and vegetables. This is surprising given that this work hour category was also associated with increased likelihood of eating on the run and being too busy to eat healthfully, which are associated with lower fruit and vegetable intake.^{10,11} It may be that these young women are more intentional about actually eating healthfully given their busy schedules and/or constraints on their time. Though they may feel too busy, in reality their reduced number of working hours may leave time to invest in ensuring a more healthful dietary pattern compared to those working 40 or more hours per week. Future research should continue to explore dietary attitudes, behaviors, and intake among women who work part-time hours, with a focus on the structure of work (eg, number of jobs, weekday vs weekend work).

Strengths of this study include a large, diverse population-based sample of young adults and the assessment of multiple beliefs and behaviors regarding healthful eating that have been relatively unexamined in relation to the number of hours worked per week. Our study is limited by reliance on self-reports of hours worked per week, which may have been over- or underreported by participants. Additionally our cross-sectional study design limits the ability to suggest the observed associations are causal; young adults who place less value on eating healthful meals may be more willing to work long hours. Finally, although our study considered whether young adults were living with children, this brief measure may not fully capture variation in the time commitments associated with child care. Future research should collect information on other occupational variables (eg, occupation type, location of work, job stress, shiftwork, multiple jobs) that may impact health behaviors.^{45,46} In addition, it may be fruitful to account for age or number of children with regard to living situation, as older children may be able to help with child care or meal preparation.

CONCLUSION

Our findings indicate that the number of hours worked per week was associated with time-related beliefs and behaviors regarding healthful eating and to a lesser extent, dietary intake, among both young adult men and women. Working more than 40 hours per week may have adverse implications for healthful eating behaviors among young adults, and although young adult women working part-time experienced time pressure barriers, they also exhibited the most healthful dietary intake (ie, fruit and vegetable consumption). The years of young adulthood are typically characterized as a time of unstable employment.^{47–49} Young adults in these early stages of career development are likely to experience changes in their employment status (eg, moving between jobs, experiencing bouts of unemployment), starting and switching career fields, as well as settling into careers and moving up the career ladder.⁴⁷ Our results indicate that one measure of work life, hours worked per week, may influence attitudes toward healthful eating and ability to have a stable meal structure. Nutrition educators working with young adults should seek to understand their definition of healthful eating and related time barriers they experience. This kind of information may assist in developing messages and services that fit their unique lifestyles. Further, they should encourage regular meals and breakfast consumption and provide strategies for preparing quick meals for those managing busy work schedules. Young adult females who

work part-time may be a particularly important group to reach with these messages, to help them juggle work schedules and other competing demands.

The current study, along with other research,^{46,50} may also be useful in informing various types of interventions, such as workplace interventions and occupational policies. There has been increased recognition of the importance of worksites as a venue for promoting healthful lifestyles for employees.⁵¹ Research should continue to evaluate workplace policies that may be time constraining (eg, restrictions on the frequency and length of overtime) as this may have impact on lifestyle behaviors. Additionally, research exploring expanded flextime and flexibility in using days off (vacation, sick time)⁴⁶ may inform how to assist individuals who have long work hours or less predictable, part-time schedules in balancing their commitments while allowing time for healthful dietary behavior. In addition, future research should also develop and evaluate interventions that facilitate access to quick and convenient healthful foods. Programs such as free fresh fruit and vegetable distribution at worksites have shown positive effects on subsequent consumption⁵² and merit further study. Such strategies may be particularly important given the high prevalence of frequent fast food consumption and low prevalence of fruit and vegetable consumption among working young adults. Finally, future research needs to understand the multiple influences on young adults' busy lives so that intervention strategies can be designed that can fit with these realities.

References

1. Nelson M, Story M, Larson N, et al. Emerging adulthood and college-aged youth: an overlooked age for weight-related behavior change. *Obesity*. 2008; 16(10):2205–2211. [PubMed: 18719665]
2. Paeratakul S, Ferdinand DP, Champagne CM, et al. Fast-food consumption among US adults and children: dietary and nutrient intake profile. *J Am Diet Assoc*. 2003; 103(10):1332–1338. [PubMed: 14520253]
3. Krebs-Smith SM, Guenther PM, Subar AF, et al. Americans do not meet federal dietary recommendations. *J Nutr*. 2010; 140(10):1832–1838. [PubMed: 20702750]
4. House J, Su J, Levy-Milne R. Definitions of healthy eating among university students. *Can J Diet Pract Res*. 2006; 67(1):14–18. [PubMed: 16515743]
5. Andajani-Sutjahjo S, Ball K, Warren N, et al. Perceived personal, social and environmental barriers to weight maintenance among young women: a community survey. *Int J Behav Nutr Phys Act*. 2004; 1(1):15. [PubMed: 15462679]
6. Betts N, Amos R, Georgiou C, et al. What young adults say about factors affecting their food intake. *Ecol Food Nutr*. 1995; 34:59–64.
7. Greaney M, Less F, White A, et al. College students' barriers and enablers for healthful weight management: a qualitative study. *J Nutr Educ Behav*. 2009; 41(4):281–286. [PubMed: 19508934]
8. Lappalainen R, Saba A, Holm L, et al. Difficulties in trying to eat healthier: descriptive analysis of perceived barriers for healthy eating. *Eur J Clin Nutr*. 1997; 51(Suppl 2):S36–S40. [PubMed: 9222722]
9. Inglis V, Ball K, Crawford D. Why do women of low socioeconomic status have poorer dietary behaviours than women of higher socioeconomic status? A qualitative exploration. *Appetite*. 2005; 45(3):334–343. [PubMed: 16171900]
10. Welch N, McNaughton S, Hunter W, et al. Is the perception of time pressure a barrier to healthy eating and physical activity among women? *Public Health Nutr*. 2009; 12(7):888–895. [PubMed: 18647424]
11. Larson N, Nelson M, Neumark-Sztainer D, et al. Making time for meals: meal structure and associations with dietary intake in young adults. *J Am Diet Assoc*. 2009; 109(1):72–79. [PubMed: 19103325]
12. Crawford D, Ball K, Mishra G, et al. Which food-related behaviours are associated with healthier intakes of fruits and vegetables among women? *Public Health Nutr*. 2007; 10(3):256–265. [PubMed: 17288623]

13. Elfhag K, Rssner S. Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obes Rev.* 2005; 6(1):67–85. [PubMed: 15655039]
14. Timlin MT, Pereira MA. Breakfast frequency and quality in the etiology of adult obesity and chronic diseases. *Nutr Rev.* 2007; 65(6 Pt 1):268–281. [PubMed: 17605303]
15. Kearney JM, McElhone S. Perceived barriers in trying to eat healthier—results of a pan-EU consumer attitudinal survey. *Br J Nutr.* 1999; 81(Suppl 2):S133–S137. [PubMed: 10999038]
16. Caruso CC. Possible broad impacts of long work hours. *Ind Health.* 2006; 44(4):531. [PubMed: 17085913]
17. Grosch JW, Caruso CC, Rosa RR, Sauter SL. Long hours of work in the U.S.: associations with demographic and organizational characteristics, psychosocial working conditions, and health. *Am J Ind Med.* 2006; 49(11):943–952. [PubMed: 17036350]
18. Sonnentag S. The recovery experience questionnaire: development and validation of a measure for assessing recuperation and unwinding from work. *J Occup Health Psychol.* 2007; 12(3):204. [PubMed: 17638488]
19. Sonnentag. Job stressors and the pursuit of sport activities: a day-level perspective. *J Occup Health Psychol.* 2009; 14(2):165–181. [PubMed: 19331478]
20. Jones F, O'Connor DB, Conner M, et al. Impact of daily mood, work hours, and iso-strain variables on self-reported health behaviors. *J Appl Psychol.* 2007; 92(6):1731–1740. [PubMed: 18020809]
21. Wardle J, Steptoe A, Oliver G, Lipsey Z. Stress, dietary restraint and food intake. *J Psychosom Res.* 2000; 48(2):195–202. [PubMed: 10719137]
22. Devine CM, Farrell TJ, Blake CE, et al. Work conditions and the food choice coping strategies of employed parents. *J Nutr Educ Behav.* 2009; 41(5):365–370. [PubMed: 19717121]
23. Lake AA, Hyland RM, Rugg-Gunn AJ, et al. Healthy eating: perceptions and practice (the ASH30 study). *Appetite.* 2007; 48(2):176–182. [PubMed: 17113681]
24. Povey R, Conner M, Sparks P, et al. Interpretations of healthy and unhealthy eating, and implications for dietary change. *Health Educ Res.* 1998; 13(2):171–183. [PubMed: 10181016]
25. Falk LW, Sobal J, Bisogni CA, et al. Managing healthy eating: definitions, classifications, and strategies. *Health Educ Behav.* 2001; 28(4):425–439. [PubMed: 11465155]
26. Neumark-Sztainer D, Story M, Hannan PJ, Croll J. Overweight status and eating patterns among adolescents: where do youths stand in comparison with the healthy people 2010 objectives? *Am J Public Health.* 2002; 92(5):844–851. [PubMed: 11988458]
27. Neumark-Sztainer D, Croll J, Story M, et al. Ethnic/racial differences in weight-related concerns and behaviors among adolescent girls and boys: findings from project EAT. *J Psychosom Res.* 2002; 53(5):963–974. [PubMed: 12445586]
28. Larson NI, Neumark-Sztainer D, Story M, et al. Identifying correlates of young adults' weight behavior: survey development. *Am J Health Behav.* 2011; 35(6):712–725. [PubMed: 22251762]
29. French SA, Story M, Neumark-Sztainer D, et al. Fast food restaurant use among adolescents: Associations with nutrient intake, food choices and behavioral and psychosocial variables. *Int J Obes Relat Metab Disord.* 2001; 25(12):1823–1833. [PubMed: 11781764]
30. Feskanich D, Rimm EB, Giovannucci EL, et al. Reproducibility and validity of food intake measurements from a semiquantitative food frequency questionnaire. *J Am Diet Assoc.* 1993; 93(7):790–796. [PubMed: 8320406]
31. United States Department of Agriculture. [Accessed December 1, 2011] Choose MyPlate. (online). Available at: <http://www.choosemyplate.gov/>
32. Feldman D. Reconceptualizing the nature and consequences of part-time work. *Acad Manage Rev.* 1990; 15(1):103–112. [PubMed: 10106335]
33. Larson N, Neumark Sztainer D, Harnack L, et al. Fruit and vegetable intake correlates during the transition to young adulthood. *Am J Prev Med.* 2008; 35(1):33–37. [PubMed: 18482818]
34. Little RJA. Survey nonresponse adjustments. *Int Stat Rev.* 1986; 54:139.

35. Maruyama S, Morimoto K. Effects of long workhours on life-style, stress and quality of life among intermediate japanese managers. *Scand J Work Environ Health*. 1996; 22(5):353–359. [PubMed: 8923608]
36. Nakamura K, Shimai S, Kikuchi S, et al. Increases in body mass index and waist circumference as outcomes of working overtime. *Occup Med*. 1998; 48(3):169–173.
37. Shields M. Long working hours and health. *Health Reports*. 1999; 11:33–48. [PubMed: 10618741]
38. Devine CM, Connors MM, Sobal J, Bisogni CA. Sandwiching it in: spillover of work onto food choices and family roles in low- and moderate-income urban households. *Soc Sci Med*. 2003; 56(3):617–630. [PubMed: 12570978]
39. Roos E, Lahelma E, Virtanen M, et al. Gender, socioeconomic status and family status as determinants of food behaviour. *Soc Sci Med*. 1998; 46(12):1519–1529. [PubMed: 9672392]
40. Presser HB. Job, family, and gender: determinants of nonstandard work schedules among employed Americans in 1991. *Demography*. 1995; 32(4):577. [PubMed: 8925948]
41. Jabs J, Devine CM. Time scarcity and food choices: an overview. *Appetite*. 2006; 47(2):196–204. [PubMed: 16698116]
42. Bureau of Labor Statistics. [Accessed October 29, 2011] Women in the labor force: A databook. (online). Available at: <http://www.bls.gov/cps/wlf-databook2010.htm>
43. Presser HB. Race-ethnic and gender differences in nonstandard work shifts. *Work Occup*. 2003; 30(4):412.
44. Loughlin C, Barling J. Young workers' work values, attitudes, and behaviours. *J Occ Org Psych*. 2001; 74:543–558.
45. Marmot MG, Smith GD, Stansfeld S, et al. Health inequalities among british civil servants: The Whitehall II Study. *The Lancet*. 1991; 337(8754):1387–1393.
46. Caruso CC. Long working hours, safety, and health: toward a national research agenda. *Am J Ind Med*. 2006; 49(11):930. [PubMed: 16948157]
47. Bradley H, Devadason R. Fractured transitions: young adults' pathways into contemporary labour markets. *Sociology*. 2008; 42(1):119–136.
48. Fenton S, Dermott E. Fragmented careers?: Winners and losers in young adult labour markets. *Work Employ Soc*. 2006; 20(2):205–221.
49. Rindfuss R. The young adult years: diversity, structural change, and fertility. *Demography*. 1991; 28(4):493–512. [PubMed: 1769399]
50. Engbers LH, van Poppel MN, Chin A, Paw MJ, van Mechelen W. Worksite health promotion programs with environmental changes: a systematic review. *Am J Prev Med*. 2005; 29(1):61–70. [PubMed: 15958254]
51. Sorensen G, Landsbergis P, Hammer L, et al. Preventing chronic disease in the workplace: a workshop report and recommendations. *Am J Public Health*. 2011; 101(Suppl 1):S196–207. [PubMed: 21778485]
52. Backman D, Gonzaga G, Sugeran S, et al. Effect of fresh fruit availability at worksites on the fruit and vegetable consumption of low-wage employees. *J Nutr Educ Behav*. 2011; 43(4 Suppl 2):S113–21. [PubMed: 21683280]

Table 1
Hours Worked Per Week by Demographic and Other Characteristics of Participants in Project EAT-III (N=2287)

	Hours worked per week					P-value ^a
	0	1-19	20-39	40	≥40	
Total (%)	n	246	534	698	440	
		11.5	24.9	32.6	20.5	
Gender (%)						0.006
Male	964	11.1	10.3	22.0	33.1	23.5
Female	1177	11.8	10.7	27.3	32.2	18.0
Race (%)						<0.001
White	1053	8.5	9.3	25.2	31.1	26.0
Black/African American	399	18	10.8	26.8	31.1	13.3
Asian	386	11.9	11.7	20.2	39.1	17.1
Other ^b	279	11.5	12.9	28.0	31.5	16.1
Education (%)						<0.001
Up to HS graduate	889	15.1	13.9	27.9	29.0	14.1
Voc/associate degree	531	8.5	8.5	31.3	32.8	19.0
College degree or higher	661	8.5	7.3	16.6	37.5	30.1
Student Status (%)						<0.001
Not a student	1439	9.4	8.0	22.7	35.9	24.0
Part-time	241	10.8	13.3	28.6	34.0	13.3
Full-time	322	21.7	18.9	35.7	15.2	8.4
Graduate student	135	11.1	12.6	14.8	36.3	25.2
Live with spouse/partner (%)						<0.001
Yes	1025	10.0	9.1	21.5	35.8	23.6
No	1117	12.8	11.7	28.1	29.6	17.7
Live with children (%)						0.007
Yes	353	15.3	7.1	27.8	32.9	17.0
No	1787	10.7	11.1	24.4	32.6	21.2
Age (mean)	2093	24.9	24.8	25.2	25.5	25.7

Note.

^aPearson chi-square, except for age comparison (ANOVA)

^bOther category includes individuals identifying as Hispanic, Native American, or Mixed Race.

Percentages are weighted to reflect the probability of responding to the Project EAT-III survey.

Sample sizes of individual analyses vary slightly due to a small degree of missing data.

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Percentage (Unadjusted) of Male and Female Participants Reporting Time-related Beliefs and Behaviors Regarding Healthful Eating and Dietary Intake

Table 2

	Males (n=1030)	Females (n=1257)	P-value ^d
Beliefs and Behaviors(% reporting somewhat/strongly agree)			
Too busy to eat healthy foods	33.6	36.6	0.137
Too rushed in the morning to eat a healthy breakfast	53.5	49.6	0.066
Don't have time to think about eating healthy	25.5	26.4	0.630
Eating healthy meals takes too much time	31.3	35.7	0.027
Hard to find time to sit down and eat a meal	30.6	38.4	<0.001
Tend to "eat on the run"	55.5	54.2	0.538
Regular meals are important to me	77.8	82.5	0.005
Eat meals at about the same time every day	58.7	60.8	0.307
Dietary Intake			
Fast Food(% reporting 1 time/week)	77.5	66.4	<0.001
Fruits and Vegetables(% reporting 5 svgs/day)	26.4	34.2	<0.001

^dPearson chi-square test of difference in percentage by gender

Percentages are weighted to reflect the probability of responding to the Project EAT-III survey.

Table 3
Male Participants: Time-related Beliefs and Behaviors Regarding Healthful Eating and Dietary Intake by Weekly Hours of Paid Work

	Hours worked per week, Unadjusted %				P ^a
	0 n=108	1-19 n=101	20-39 n=209	40 (ref) ^b n=311	
Beliefs and Behaviors(% reporting somewhat/strongly agree)					
Too busy to eat healthy	23.1	29.9	31.7	31.9	43.6* 0.010
Too rushed in the morning to eat a healthy breakfast	36.9*	47.9	58.0	53.5	61.0* <0.001
Don't have time to think about eating healthy	26.4	20.2	25.6	25.2	27.3 0.609
Eating healthy meals takes too much time	24.5	29.2	34.7	28.0	40.1* 0.013
Hard to find time to sit down and eat a meal	28.3	29.9	32.5	25.8	38.6* 0.025
Tend to "eat on the run"	51.4	54.6	54.7	56.0	59.6 0.182
Regular meals are important to me	74.5	83.5	77.3	83.0	73.2* 0.008
Eat meals at about the same time every day	50.0*	52.0*	50.2*	67.1	61.2* 0.026
Dietary Intake					
Fast Food(% reporting 1 time/week)	76.4	72.7	75.0	80.1	79.6 0.131
Fruits and Vegetables(% reporting 5 svgs/day)	30.4	33.0	29.2	22.7	24.8 0.352

^aModel is adjusted for education, race, age, student status, living with partner/spouse, and living with children. P-values represent significant associations between weekly hours of paid work and beliefs and behaviors/dietary intake for the overall work hour variable in the logistic regression model (df=4).

^bReference category: 40 hours per week

* Asterisks denote significant differences (P<0.05) in prevalence between work hour category and the reference category (ie, 40 hours/week) in logistic regression model.

Table 4
 Female Participants: Time-related Beliefs and Behaviors Regarding Healthful Eating and Dietary Intake by Weekly Hours of Paid Work

	Hours worked per week, %					P ^a
	0 n=117	1-19 n=124	20-39 n=321	40 (ref) ^b n=377	>40 n=243	
Beliefs and Behaviors(% reporting somewhat/strongly agree)						
Too busy to eat healthy	28.8	36.0	42.6*	33.9	37.3	0.020
Too rushed in the morning to eat a healthy breakfast	39.7*	47.2	52.6	50.7	51.6	0.016
Don't have time to think about eating healthy	20.1	28.2	28.8	23.2	28.4*	0.014
Eating healthy takes too much time	28.3	33.3	36.4	37.6	36.5	0.349
Hard to find time to sit down and eat a meal	36.2	32.5	42.1	35.1	42.0	0.377
Tend to "eat on the run"	41.7	49.2	61.6*	50.8	59.7*	0.002
Regular meals are important to me	78.4	85.6	78.7	84.6	85.3	0.165
Eat meals at about the same time every day	51.8*	55.6*	48.9*	72.5	66.5*	<0.001
Dietary Intake						
Fast Food(% reporting 1 time/week)	68.1	60.8	64.9	66.0	60.2	0.437
Fruits and Vegetables(% reporting 5 svgs/day)	36.9	28.8	42.3*	30.3	29.6	0.026

^aModel is adjusted for education, race, age, student status, living with partner/spouse, and living with children. P-values represent significant associations between weekly hours of paid work and beliefs and behaviors for the overall work hour variable in the logistic regression models (df=4).

^bReference category: 40 hours per week

* Asterisks denote significant differences (P<0.05) in prevalence between work hour category and the reference category (ie, 40 hours/week) in logistic regression model.