



Short Communication

Fast food consumption is associated with higher education in women, but not men, among older adults in urban safety-net clinics: A cross-sectional survey

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ABSTRACT

Fast food consumption is linked to poor health, yet many older adults regularly consume fast food. Understanding factors contributing to fast food consumption is useful in the development of targeted interventions. The aim of this study was to characterize how fast food consumption relates to socio-demographic characteristics in a low-income sample of older adults.

This study used cross-sectional survey data of 50 to 79-year-olds (N=236) in urban safety-net clinics in 2010 in Kansas City, KS. Self-reported frequency of fast food consumption was modeled using ordinal logistic regression with socio-demographics as predictor variables. Participants were 56.8 ± 6.0 (mean \pm SD) years old, 64% female, 45% non-Hispanic African American, and 26% Hispanic. Thirty-nine percent denied eating fast food in the past week, 36% ate once, and 25% ate fast food at least twice. Age was negatively correlated with fast food intake ($r = -0.20$, $P = 0.003$). After adjusting for age, race-ethnicity, employment, and marital status, the association between education and fast food consumption differed by sex ($P_{\text{interaction}} = 0.017$). Among women, higher education was associated with greater fast food intake (Spearman's correlation; $r = 0.28$, $P = 0.0005$); the association was not significant in men ($r = -0.14$, $P = 0.21$). In this diverse, low-income population, high educational attainment (college graduate or higher) related to greater fast food intake among women but not men. Exploration of the factors contributing to this difference could inform interventions to curb fast food consumption or encourage healthy fast food choices among low-income, older adults.

1. Introduction

Good nutrition is important for older adults (Bernstein and Munoz, 2012). Eating fast food makes it harder to maintain a healthy diet (Moore et al., 2009). Fast food intake is associated with greater body mass index (Bowman and Vinyard, 2004), adult weight gain (Pereira et al., 2005), the development of insulin resistance (Pereira et al., 2005), and increased mortality risk (Barrington and White, 2016); therefore, the rise of fast food consumption in the U.S. and around the world (Bowman and Vinyard, 2004) is a public health concern.

Previous research has identified major risk factors for eating fast

food. Living near fast food outlets is associated with greater consumption (Moore et al., 2009). In a nationally representative sample of U.S. adults, fast food consumption was associated with higher household income, African American racial-ethnic identity, and younger age (Bowman and Vinyard, 2004). Among high consumers, the most commonly cited reasons for eating fast food are convenience and taste (Rydell et al., 2008). However, in reports describing risk factors for fast food consumption (Bowman and Vinyard, 2004; French et al., 2000; Moore et al., 2009; Pereira et al., 2005; Rydell et al., 2008; Satia et al., 2004), there has been scant attention to how sex may influence associations with fast food consumption.

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Women eat differently from men in part because women tend to believe that healthy eating is more important (Wardle et al., 2004). A qualitative study of older adults found that barriers to healthy eating differ for men and women; men struggle with taste preferences, convenience of fast food, and a lack of self-control, while women found the greatest difficulty in cooking healthy meals (Wu et al., 2009). Identifying sex differences in reasons for consuming fast food would be valuable for the development of targeted interventions.

Hence, we sought to characterize how fast food consumption relates to socio-demographic characteristics in a sample of low-income, older adults.

2. Materials and methods

The aim of this study was to characterize how fast food consumption relates to socio-demographic characteristics in a low-income sample of older adults. Electronic surveys were administered to 236 adults aged 50–79 years in safety-net clinics in the Kansas City metropolitan area. Self-reported frequency of fast food consumption was modeled using ordinal logistic regression with socio-demographics as predictor variables.

2.1. Recruitment

Participants were recruited from nine safety-net clinics in the Kansas City metropolitan area. Study staff screened participants for eligibility and obtained informed consent, which was approved by University of Kansas Medical Center's Institutional Review Board. Eligibility criteria included age ≥ 50 years, income $\leq 150\%$ of the Federal Poverty Level, current home address and working phone, no family history of colorectal cancer < 60 years, and not up to date with colorectal cancer screening. The participants of this study include the 236 individuals who were randomized to the Comparison group in a randomized controlled trial of a touchscreen intervention of "implementation intentions" (a stage-theory-framed model of health behavior change) with a primary outcome of colorectal cancer screening completion. The comparison group completed a health survey, including information about fast food intake, that was time-matched to the touchscreen intervention. More detail about the parent study is available elsewhere (Greiner et al., 2014).

2.2. Data collection and variable coding

Participants answered questions on a touchscreen computer in the waiting area of the safety net clinic before their scheduled appointment. The content was presented in English or Spanish.

Age was measured in years. Participants were classified by their self-reported, combined race and ethnicity as non-Hispanic African American, non-Hispanic White, Hispanic, and non-Hispanic Other.

Employment status was consolidated into a categorical variable with three levels: employed (full-time and part-time), home by choice (homemaker and retired), and unemployed (unemployed, disability/unable to work, seasonal, and other).

Marital status was consolidated into a dichotomous variable (partner versus no partner), conveying whether the person had a romantic partner: married and living with partner were included in the partner variable while the no partner variable included those indicating divorced/separated, widowed, never married, and other.

Education was consolidated into four levels (less than high school completion, high school completion or GED, some college or technical school degree, and at least college graduate). Participants were also asked if they had health insurance.

Fast food consumption was measured with the following question: "During the past week, on how many times did you eat fast food from restaurants like McDonald's, Pizza Hut, KFC, Taco Bell, or from convenience stores like Casey's or Kwik Shop?" Participants could respond

with "None," "One," "2–3," or "4 or more." Fast food consumption frequency was consolidated from four to three levels, because only seven participants (2.9%) reported frequenting a fast food outlet four or more times in the past week.

2.3. Statistical approach

Associations with the dependent variable, fast food intake, were analyzed using ordinal logistic regression modeling (Brant, 1990) using JMP version 13.0 (SAS Institute). Independent variables included age, race-ethnicity, employment, marital status, education, sex, and a two-way interaction term between sex and each of the independent variables. Using a threshold of $P < 0.05$ as statistically significant, each two-way interaction term was tested with inclusion of all other covariates. The strength of association between an independent variable and fast food consumption is conveyed by Spearman's correlation.

Several sensitivity analyses were performed to assess the dependence of significant findings on the chosen statistical approach. First, other covariates were removed to assess if adjustment for confounders was responsible for statistical significance. Next each consolidation scheme (employment, marital status, education level, and fast food intake) was tested by individually replacing the variable with its raw counterpart. Finally, fast food intake was modeled as a continuous variable using linear regression.

3. Results

Participants were 56.8 ± 6.0 (mean \pm SD) years old. The mean age in years was 57.2 ± 6.5 for women and 56.2 ± 4.9 for men (mean \pm SD). The age distribution was skewed toward the lower end of the eligible range. Table 1 summarizes participant characteristics. A majority reported membership to a racial-ethnic minority. Low educational attainment, high unemployment, and common lack of health insurance indicate the economic vulnerability of the study population. Men and women had significantly different distributions of employment status; however, men and women were comparable on all other reported measures.

In the fully-adjusted model, the association between education and fast food consumption differed by sex ($P_{\text{interaction}} = 0.017$); in this model, the only other significant predictor of fast food intake was age ($P = 0.023$). Among women, higher education was associated with greater fast food intake (Spearman's correlation; $r = 0.28$, $P = 0.0005$), while the association was not significant in men ($r = -0.14$, $P = 0.21$) (Fig. 1). Without inclusion of other covariates, age negatively correlated with fast food intake ($r = -0.20$, $P = 0.003$) (not shown).

Sensitivity analyses showed that statistical significance of the two-way interaction was not contingent on inclusion of covariates ($P = 0.0023$) or variable consolidation schemes (all $P < 0.05$). Additionally, a similar result was obtained when modeling fast food intake as a continuous variable ($P = 0.024$). We performed one final analysis stratified by employment status out of theoretical concern that this variable was confounding our main observation; this revealed that the interaction term between education and sex was strongest among those employed ($P = 0.0035$) and absent among those home by choice ($P = 0.64$) and unemployed ($P = 0.37$).

4. Discussion

This is the first report of a significant interaction between sex, education, and fast food consumption. Higher education was correlated with greater frequency of fast food intake among women, but not men. The interaction was statistically independent of important covariates. Stratified analysis showed that the interaction was chiefly coming from the older adults who were regularly working outside of the home. Also, in our sample of older adults, we corroborated the observation that younger people tend to eat fast food more frequently.

Table 1
Characteristics of male and female participants.

		Men (n = 85)		Women (n = 151)		P ^b
		n	%	n	%	
Race-ethnicity	Non-Hispanic AA	38	45%	70	46%	0.81
	Hispanic	20	24%	41	27%	
	Non-Hispanic white	25	29%	36	24%	
Education	Non-Hispanic other	2	2%	4	3%	0.061
	< High school grad	18	21%	52	34%	
	High school/GED	31	37%	40	27%	
	College/Tech School	21	25%	43	29%	
Employment	≥ College grad	15	18%	16	11%	0.0001 ^a
	Employed	21	25%	41	27%	
	Home by choice	7	8%	45	30%	
	Unemployed	57	67%	65	43%	
Marital Status	No partner	57	67%	115	76%	0.13
	Partner	28	33%	36	24%	
Have health insurance?	Yes	26	31%	34	23%	0.17
How many times did you eat fast food in the past week?	None	31	37%	61	40%	0.67
	Once	30	35%	55	36%	
	2 or more	24	28%	35	23%	

GED, General Educational Development. AA, African American.

^a Denotes significance.

^b P-value assesses the difference in proportions between men and women calculated by Pearson's chi-squared test or the mean difference in age by Student's *t*-test. Kansas City, KS. 2010.

Reports of associations between education and fast food consumption provide inconsistent results in varied populations. Pereira et al. reported education was negatively associated with fast food intake among non-Hispanic white people and observed an overall trend of decreasing fast food intake among white people during the 15 year prospective study (Pereira et al., 2005). Another study reported that, among working Americans who purchase their lunch, those younger and less educated were significantly more likely to choose fast food (Blanck et al., 2009). However, a representative sample of adults aged 18–64 years in Michigan revealed no association between fast food consumption frequency and education (Anderson et al., 2011). In younger, non-Hispanic African American populations, no evidence has been reported of an association between education and fast food consumption frequency (Pereira et al., 2005; Satia et al., 2004). Likewise, education was not associated with fast food consumption in a sample of younger women (20–45 years) (French et al., 2000). Existing literature illustrates how the relationship between education and fast food consumption is nuanced; it is moderated by sex, race-ethnicity, and possibly age. Therefore, future research in this area of public health and nutrition should analyze after stratification.

Eating more fast food is associated with citing too little time for cooking (Rydell et al., 2008). As reviewed elsewhere, time scarcity is a major contributor to unhealthy food choices (Jabs and Devine, 2006). Employed Americans eat fast food more often than people who are not working (French et al., 2000). Notably, higher education correlates with a higher level of job involvement, including more complex work tasks and more responsibility (Griep et al., 2016; Schieman et al., 2006). In the United States, women are more likely than men to spend time outside of paid work on food preparation and housework (Statistics, B.o.L., 2016). Women are also more likely than men to be primary caretakers of both children and aging parents (Bureau, 2016; Navaie-Waliser et al., 2002). Consequently, work-family conflict and stress associated with work-family conflict correlate with increased job involvement for women but not for men (Falkenberg et al., 2017). Differences between men and women in total workload (paid work and family/household responsibilities) may put women at disproportionate risk for work-family conflict, time-scarcity, and associated health hazards. Having too little time to prepare healthy food may be an important contributor to poor dietary choices among older, well-educated women.

The positive association we have identified here between fast food consumption and female education, especially among those employed, could reflect that highly educated women have higher work involvement than less educated women in addition to being more responsible for dependent care, housework, and food preparation for themselves and their households, compared to their male counterparts. Indeed, one qualitative study analyzing differences in healthy behaviors between older men and women states “men said that their wives were responsible for healthy diets” (Wu et al., 2009).

Although the nutritional dangers of fast food must be emphasized, there is some evidence that visiting fast food restaurants can be beneficial. For instance, some older adults frequent fast-food outlets for positive social activity (Cheang, 2002). Also, some fast food options can be classified as healthy food choices.

The results of this study are subject to the limitations of our data. We did not collect data on the number of children or other dependents in the household, and we do not know what degree of caretaking responsibility any of the participants had. We also do not know what participants chose to eat when they ate fast food or what their portion sizes were. Finally, our study population comprises only older adults. Further research is needed to determine whether a positive association between fast food consumption and female education is present in a younger study population.

5. Conclusions

In this study, we found that the association between fast food intake and education depends on sex. Higher education in our sample population is correlated with greater fast food intake among women, but not men. Furthermore, the interaction term between education and sex was strongest among those employed. Understanding how socio-demographic characteristics relate to fast food intake will help inform practical solutions to this important public health problem.

Declarations

Ethics approval and consent to participate

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving human subjects

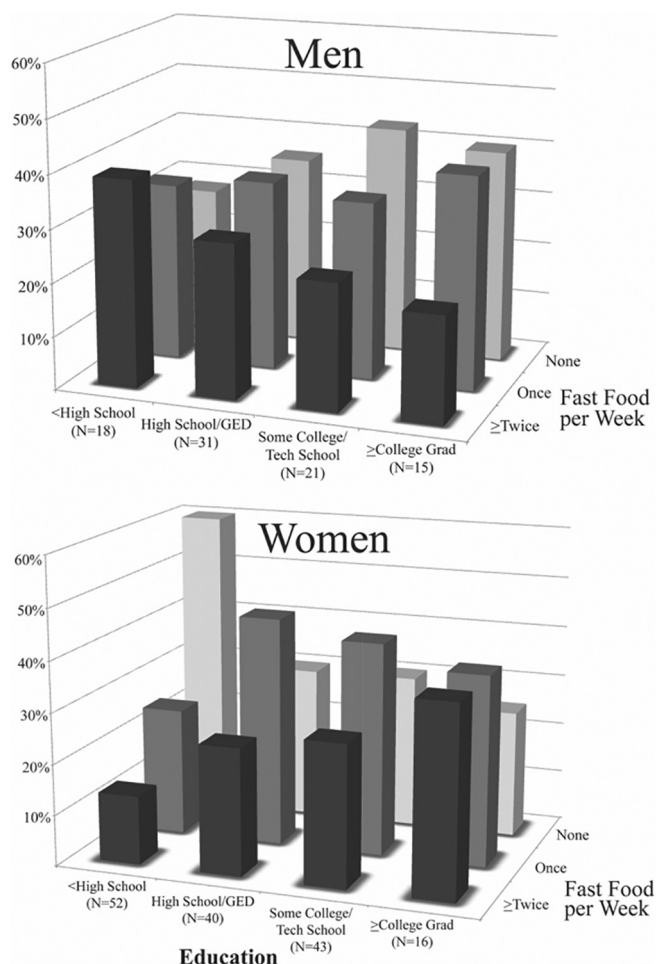


Fig. 1. Fast food consumption and education level by sex.

Association between education and fast food consumption differed significantly by sex ($P_{\text{interaction}} = 0.017$ including covariates; age, race-ethnicity, employment status, and marital status). The percentage represents the proportion of those with that level of education who reported that level of fast food intake. Among women, higher education was associated with greater fast food intake ($r = 0.28$, $P = 0.0005$). Education was not associated with fast food intake among men ($r = -0.14$, $P = 0.21$). Kansas City, KS. 2010.

were approved by the University of Kansas Medical Center's Institutional Review Board. Written informed consent was obtained from all subjects.

Consent for publication

Not Applicable.

Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interest.

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Authors' contributions

BH contributed toward design, statistical analysis, and writing; CH, CD and KG contributed to design, analysis, and writing; and KB contributed to analysis, and writing.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2018.09.005>.

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