

Educational Attainment and Health Behaviors Among Young Adult Men: Racial/Ethnic Disparities

American Journal of Men's Health
November-December 2019: 1–11
© The Author(s) 2019
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1557988319894488
journals.sagepub.com/home/jmh



Jaewon Lee¹  and Jisuk Seon^{1,2}

Abstract

Although promoting health behaviors are important for sustaining physical and mental health, little is known about young adult men's health behaviors or how they vary across race and ethnicity. This study examines the impact of educational attainment on health behaviors across young adult men, and differences in the association across race/ethnicity. This study used data from the National Longitudinal Survey of Youth 1979 Children and Young Adults. The final sample consists of 3,115 non-Hispanic White males, 1,617 African American males, and 1,144 Hispanic males. The average age of the participants was about 27 years old. Multiple linear regression and logistic regression analyses were conducted. Educational attainment was associated with both food intake and preventive health care visits. Those who received a higher education were less likely to eat fast food than those who did not ($\beta = -.37, p < .001$) and were more likely to eat fruits and vegetables ($\beta = .77, OR = 2.15, p < .01$; $\beta = 6.44, OR = 1.91, p < .10$). Higher education was also positively associated with routine eye exams and health check-ups ($\beta = .50, OR = 1.64, p < .01$; $\beta = 1.84, OR = 6.29, p < .01$). This study identified interaction effects between educational attainment and African Americans for predicting fast food intake ($\beta = .57, p < .05$). Education is one way to improve health behaviors and to lessen racial/ethnic disparities in health behaviors. Specifically, promoting health behaviors in education should target African American men to improve their perception toward the importance of healthy food intake.

Keywords

General health and wellness, health education, general health and wellness, health awareness, health care issues

Received March 3, 2019; revised October 24, 2019; accepted November 20, 2019

Health-promoting behaviors are important for sustaining one's daily life. Unhealthy behaviors, such as a lower intake of fruits and vegetables and skipping visits for preventive health care check-ups, may lead to numerous negative health consequences, including physical and mental health problems, serious illnesses, and shorter longevity (Mahalik et al., 2007). Previous research has revealed that men are more likely to engage in unhealthy behaviors (e.g., substance use, not seeking medical help, and fast food consumption) and suffer from poorer health outcomes (e.g., obesity and chronic diseases), compared to women (Courtenay, 2000; Olson et al., 2017). Among all other age groups, the health behaviors of young adult men (18–35 years) are particularly critical because it is a developmental transition stage for building health-behavior routines, such as nutritional assessments and medical check-ups, and the effects could last long into their mature adulthood (Harris et al., 2006). Despite this

importance, little is known about young adult men's health behaviors. Even though previous research has indicated that minorities tend to have fewer healthy behaviors and poorer health outcomes compared to Whites, only a few studies have investigated what factors affect these disparities and how they vary across race and ethnicity. In order to address these research gaps, this

¹School of Social Work, Michigan State University, East Lansing, MI, USA

²School of Social Work, Washington University, Saint Louis, USA

Corresponding Authors:

Jaewon Lee, School of Social Work, Michigan State University, Baker Hall, 655 Auditorium Road, Room 4, East Lansing, MI 48824, USA.
Email: leejaew3@msu.edu

Jisuk Seon, School of Social Work, Washington University, Saint Louis, USA.
Email: jseon@wustl.edu



study will identify factors contributing to young adult men's health behaviors, focusing on their educational attainment and considering its significant role in health-behavior development (Cowell, 2006; Olson et al., 2017; Walsemann et al., 2018). This study will also examine how the relationship between educational attainment and health behaviors differs by race/ethnicity among young adult men.

Literature Review

Social Determinants of Health Behaviors

Social determinants of health, referred to factors in environments where people live that influence health behaviors and overall health, include access to education, access to health care services, economic stability, availability of healthy foods, safe and affordable housing, neighborhood and environments, and societal and cultural norms (The Office of Disease Prevention and Health Promotion, 2019; Short & Mollborn, 2015).

Educational Attainment. Educational attainment is the most frequently reported factor for health behaviors and health outcomes. Research on how educational attainment influences health has reported that individuals who achieved higher levels of education were more likely to practice healthier behaviors, including less substance use, greater intake of fruits and vegetables, less fast food consumption, and more frequent visits to preventive health care appointments (Cutler & Lleras-Muney, 2010; Kimbro et al., 2008; Teixidó-Compañó et al., 2018), as well as lower mortality rates (Montez et al., 2012), and better overall health (Arendt, 2005; Kimbro et al., 2008), compared to those having lower levels of education. These studies suggest that higher education attainment provides individuals with opportunities to learn valuable information about health and also increases their access to better jobs and social relationships, which have been identified to promote healthier behaviors (Cutler & Lleras-Muney, 2010; Hayward et al., 2015).

Despite the wealth of evidence documenting its important role in health behaviors, only a handful of studies have examined whether higher education attainment affects young adults' health behaviors (Cowell, 2006; Olson et al., 2017; Walsemann et al., 2018). For example, first, Olson et al. (2016) examined the relationship between young adults' individual, parental, and peer characteristics, and health behaviors using data drawn from the National Longitudinal Study of Adolescent to Adult Health. Olson et al. (2016) reported that young adult men with a postsecondary education but no additional degrees had lower risky health behaviors (e.g., less use of alcohol and drugs, less fast food consumption, greater physical

activity, and more frequent visits to preventive health care appointments). Second, Walseman et al. (2018) measured diverse pathways of educational attainment and explored how young adults who attended and completed college was associated with health behaviors, focusing on binge drinking and daily smoking, using the National Longitudinal Survey of Youth (NLSY) 1997 cohort. Walseman et al. (2018) identified that young adults with a Bachelor's degree who enrolled immediately after high school and completed their degree within 4 years were less likely to engage in binge drinking and daily smoking than those who enrolled in college immediately after high school but did not complete their Bachelor's degree within 4 years. Lastly, Cowell (2006) investigated how high school and college degrees as well as number of years of schooling influenced health behaviors (e.g., smoking and binge drinking) among young adults using the NLSY. Cowell (2006) revealed that the completion of both high school and college degrees reduced the probability of smoking and binge drinking. In addition, an increased number of years of schooling correlated with a decrease in each of the negative health behaviors (Cowell, 2006).

These studies have clearly demonstrated that higher education attainment was associated with healthier behaviors among young adult men. One study aggregated the indicators of health behaviors (Olson et al., 2017) but failed to interpret the effects of educational attainment on separate behaviors, which might provide useful information for developing more tailored interventions to target certain health behaviors. Other studies have focused only on smoking and drinking as indicators of health behaviors, excluding other possible health behaviors that may also be affected by education attainment, such as the intake of fruits and vegetables, fast food consumption, and preventive healthcare visits (Cowell, 2006; Walseman et al., 2018). Therefore, this study will focus on how educational attainment influences two dimensions of health behaviors among young adult men: food intake of fruits and vegetables, and fast food consumption, as well as preventive health care, such as eye exams and checkups.

Racial/Ethnic Disparities in Health Behaviors

Previous research on health has reported that chronic diseases and mortality rates vary significantly across racial/ethnic groups. For example, African Americans have higher mortality rates from heart disease than Whites, even after controlling for socioeconomic variables such as income. African Americans also have higher incidence rates for cancer and higher death rates following diagnosis than Whites or Hispanics (Cunningham et al., 2017). Contrarily, Hispanics have lower mortality rates from all causes than Whites (Cunningham et al., 2017; Saint Onge & Krueger, 2017).

Given the racial/ethnic disparities in chronic disease and mortality, research has examined whether and how health behaviors explain these disparities (Dubowitz et al., 2011; Harris et al., 2006; Jackson et al., 2010; Saint Onge & Krueger, 2017; Schiller et al., 2012). Dubowitz et al. (2011) examined the relationship between individual socio-demographic factors and neighborhood socioeconomic status and health behaviors, such as fruit and vegetable intake, fat intake, smoking, and binge drinking, among non-Hispanic Whites, African Americans, and Mexican Americans. Using the Third National Health and Nutrition Examination Survey, Dubowitz et al. (2011) reported that while Whites consumed more fruits and vegetables than Mexican Americans, they also had a higher percentage of kilocalories from fat and a higher prevalence of smoking than Mexican Americans. In comparison with African Americans, Whites consumed more fruits and vegetables, had a lower percentage of kilocalories from fat, and a lower percentage of smoking and drinking (Dubowitz et al., 2011). Another study looking at differences in health behaviors between Whites and Hispanics stated that Hispanics were less likely to be frequent drinkers, but also had lower levels of physical activity and were less likely to be preventive health care visitors (Schiller et al., 2012).

Studies focusing on life-course perspectives have reported that a diverse range of health behaviors vary by race/ethnicity, causing disparities to fluctuate over time. For example, Harris et al. (2006) examined longitudinal trends in racial/ethnic disparities in health behaviors from adolescence to adulthood, using the data from Healthy People 2010. They identified that diet, preventive health care visits, and substance use decreased with age. There were racial/ethnic disparities in unhealthy behaviors: while Whites and Asians were at a lowest risk, Native Americans were at a highest risk. However, no racial/ethnic groups consistently showed worsened or improved health behaviors over time (Harris et al., 2006).

Very few studies have investigated racial/ethnic disparities in the link between educational attainment and health behaviors (Kimbrow et al., 2008; Saint Onge & Krueger, 2011). Kimbro et al. (2008) examined the relationship between education and health behaviors, including smoking, drinking, and obesity, by race/ethnicity. Kimbro et al. (2008) discovered that at lower levels of education, the foreign-born had healthier behaviors than their U.S.-born counterparts, but this relationship was not observed at higher levels of education. This relationship only varied across Hispanics and Asians. Saint Onge and Kreger (2011) investigated educational differences in exercise among non-Hispanic Whites, African Americans, and Mexican Americans. Saint Onge and Kreger (2011) identified that while education and team sport exercise were negatively associated among non-Hispanic White groups, this relationship was less negative among African Americans and Mexican Americans.

Although these two studies support the idea that there are racial/ethnic differences in the impacts of educational attainment on health behaviors, the age groups of their samples are older (e.g., the mean age ranges are between 37 and 50) (Kimbrow et al., 2008; Saint Onge & Kreger, 2011). Knowing that young adulthood is an important period for establishing health behaviors (Harris et al., 2006), this study will focus on young adults to deepen the understanding of racial/ethnic disparities in the relationship between educational attainment and health behaviors.

The Current Study

Given that men are at a higher risk for unhealthy behaviors and that their healthy behaviors are greatly affected by educational attainment, it is crucial to examine how educational attainment affects young adult men's health behaviors, taking into consideration that young adulthood is an important transition time in shaping independent health behavior routines. Previous research has revealed different associations in educational attainment and health behaviors across race/ethnicity. Therefore, this study focuses on race/ethnicity disparities in the relationship between educational attainment and health behaviors among young adult men.

This study hypothesizes that (1) young adult men with higher educational attainment would engage in more health-promoting behaviors, compared to those with lower educational attainment; and (2) the relationship between educational attainment and young adult men's health behaviors would differ across race/ethnicity.

Methods

Target Sample

The primary data source for the study was drawn from the National Longitudinal Survey of Youth 1979 Children and Young Adults (NLSY79-CHYA). The respondents are children of female participants in the National Longitudinal Survey of Youth 1979 (NLSY79), which is a nation-wide representative sample of 12,686 individuals living in the United States whose ages ranged from 14 to 22 in 1979, when the survey was first conducted. The NLSY79-CHYA respondents have been reinterviewed biennially from 1994 to 2012 and the sample size has increased over time as female NLSY79 respondents have babies. In 2012, there were 11,512 children born to NLSY79 females. The NLSY79-CHYA has collected data on healthy behaviors, which includes measures of the frequency of eating fruits, vegetables, and fast foods, and of having eye exams and health checkups. The NLSY79-CHYA has also collected socio-demographic factors such as education, marriage, employment, gender,

family size, and location of residences. The current study uses the latest wave, from 2012, of the NLSY79-CHYA. Since the proposed study focuses on healthy behaviors among men, the final sample consists of 3,115 non-Hispanic White males, 1,617 African American males, and 1,144 Hispanic males. The average age of the participants in this study was about 27 years old. This study is considered nonhuman subject research since there is no identifiable personal information. In addition, as secondary data were used in this study and the data are publicly available, this study does not require approval from the Institutional Review Board.

Measures

This study considers two different dimensions in health behaviors: food intake and preventive health care visits. In this study, food intake includes three factors—fruits, vegetables, and fast food—while preventive health care visits refer to eye exam and check-up.

Outcome Variables

Food Intake

Vegetables. Respondents reported their frequency of eating vegetables by answering “How many times do you eat vegetables a week?” The response options are as follows: do not eat any vegetables, one to three times per week, four to six times per week, one time per day, two times per day, three times per day, four or more times per day. The respondents were classified into two groups: those who never eat vegetables (coded = 0) and those who eat vegetables at least once a week (coded = 1).

Fruit. Respondents were asked, “How many times do you eat fruits a week?” The respondents reported their frequency of eating fruit by answering with one of the following conditions: do not eat any fruits, one to three times per week, four to six times per week, one time per day, two times per day, three times per day, and four or more times per day. They were classified into two groups: those who never eat any fruit (coded = 0) and those who eat fruit at least once a week (coded = 1).

Fast Food. Respondents were queried about frequency of their eating fast food. They were asked, “How many times have you eaten fast food in the past week?” Higher scores indicate more frequent consumptions of fast food (mean = 1.84; median = 1.00; ranging from 0 to 25).

Preventive Health Care Visits

Eye Exam. Respondents were queried about their eye exams. They were asked when they had visited a doctor for their routine eye exam, with seven response options:

“Less than one month ago, one to three months ago, four to six months ago, seven to eleven months ago, less than two years ago, two or more years ago, and never saw a doctor for an eye exam.” The respondents were classified into two groups: those who have never visited a doctor for their eye exam (coded = 0) and those who had met with a doctor for an eye exam at least once (coded = 1).

Check-Up. Respondents answered the following question, “When did you see a doctor for your routine health check-up?” with seven response options: “Less than one month ago, one to three months ago, four to six months ago, seven to eleven months ago, less than two years ago, two or more years ago, and never saw a doctor for their check-up.” If they never visited a doctor for a health check-up, they were coded as zero, while those who experienced check-ups at least once were coded as one.

Predictor Variable

Educational Attainment. Educational attainment refers to young adult men's level of education. Education was classified into two groups: those who received postcollege education (coded = 1) and those who did not receive higher education degrees (coded = 0).

The original response options were as follows: “no degree, high school, Associate/Junior college (AA), Bachelor of Arts degree (BA), Bachelor of Science degree (BS), Master's degree, Doctoral degree, Professional degree.” Higher education included Associate/Junior College (AA), Bachelor of Arts degree (BA), Bachelor of Science degree (BS), Master's degree, Doctoral degree, and Professional degree. On the other hand, the remaining categories were regarded as nonhigher education.

Moderator

Race/ethnicity included three groups: non-Hispanic Whites, African Americans, and Hispanics. Non-Hispanic Whites were coded as a reference group, and they were compared to African Americans and Hispanics.

Other Socio-Demographic Variables

Age (ranging from 18 to 35), family size, marriage, education, employment, and residence are included in the study. In terms of marriage, those who are currently married are classified as marriage (coded = 1) while other responses were considered else (coded = 0). In regard to employment, respondents reported their employment status by answering with one of the following conditions: “Employed, unemployed, out of labor force, or in active forces.” The respondents were classified into two groups: those who were employed (coded = 1) and those who were not (coded = 0). Residences were classified into

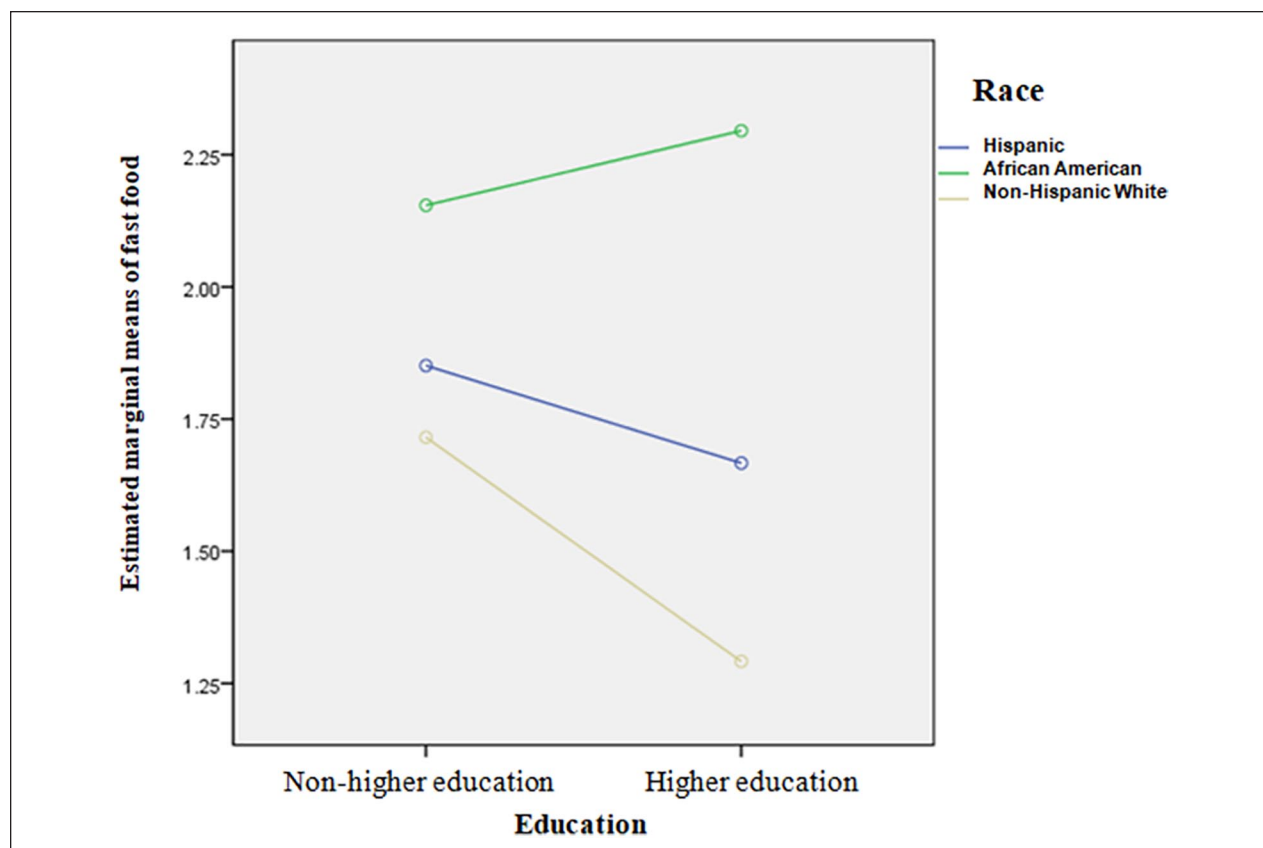


Figure 1. Effects of Educational Attainment and Race/Ethnicity on Young Adult Men's Fast Food Intake.

two groups: those who live in an urban area (coded = 1) and those who live in a rural area (coded = 0).

Analyses

Analysis of variance and chi-squared test were conducted to investigate racial/ethnic disparities in independent variables, dependent variables, and control variables. Multiple linear regression and logistic regression analyses were conducted to examine whether educational attainment influences health behaviors across men: food intake (fast food, fruits, and vegetables) and preventive health care visits (checkup and eye exam) (research question 1), and to explore whether the relationship between educational attainment and health behaviors among men differs across race/ethnicity (research question 2). The Statistical Package for the Social Sciences (SPSS) version 22.0 was used to answer the research questions. A univariate analysis was performed to show the moderating effects of race/ethnicity on the relationships between educational attainment and health behaviors. Results of the analysis will be displayed in Figures 1 and 2. The Estimated Marginal Means in Figures 1 and 2 indicate the

adjusted mean for all factors used in the relationships between educational attainment and health behaviors.

Results

Table 1 shows the racial/ethnic differences in variables used in the proposed study. In regard to healthy behaviors, African Americans reported lower levels of visiting a physician for routine eye exams than non-Hispanic Whites, and tended to eat fruit less often than both Hispanics and non-Hispanic Whites. Hispanics were less likely than non-Hispanics Whites to eat vegetables. Hispanics also indicated a higher frequency of eating fast food in comparison with African Americans and non-Hispanic Whites. There are no racial/ethnic disparities in seeing a doctor for a routine health checkup. Hispanics tended to have higher numbers of family members compared to African Americans and non-Hispanic Whites. African Americans were less likely to be married than their Hispanic and non-Hispanic White counterparts. In term of education, non-Hispanic Whites were more likely to receive higher education compared with African Americans and Hispanics. African Americans were less

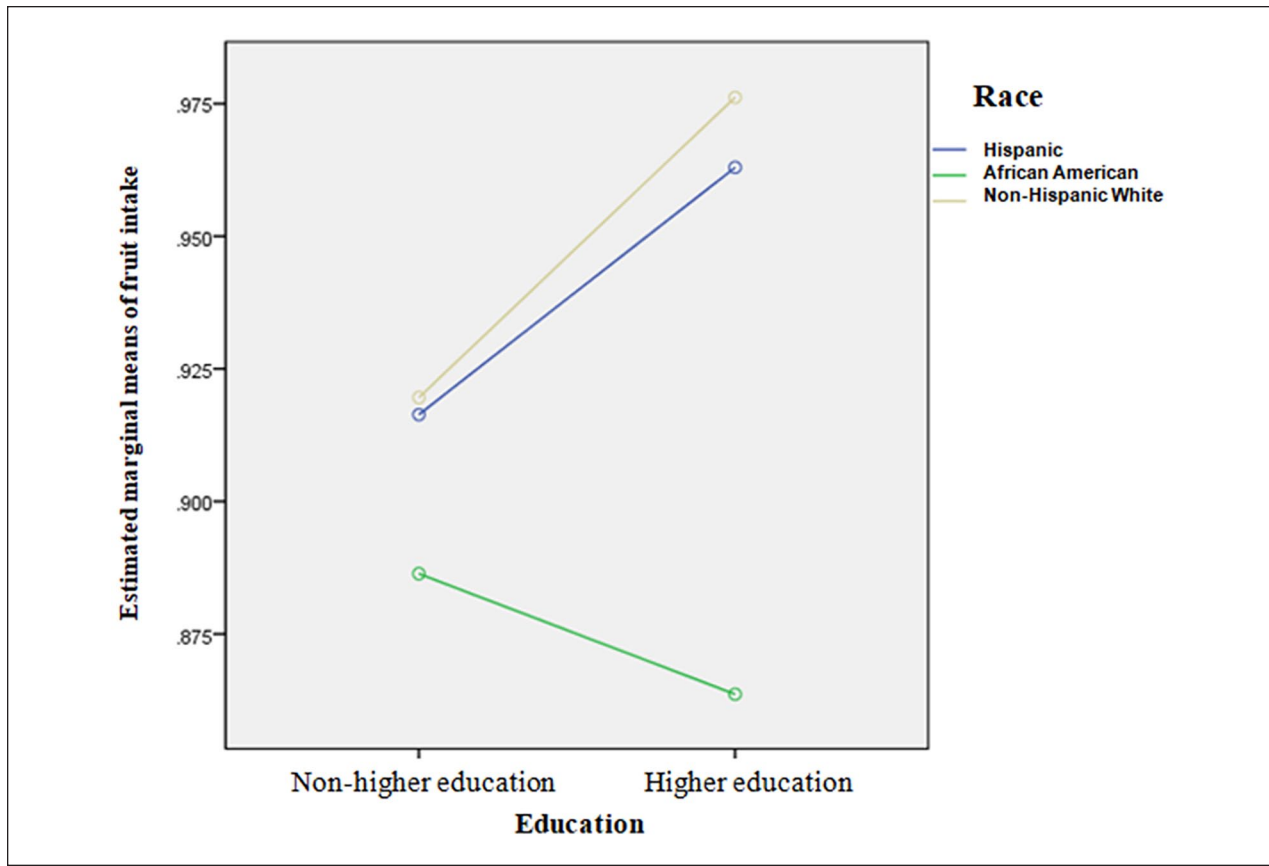


Figure 2. Effects of Educational Attainment and Race/Ethnicity on Young Adult Men's Fruit Intake.

Table 1. Descriptive Statistics and Racial/Ethnic Differences in Variables Included in the Study.

Variable	African American (n = 1,617)	Hispanic (n = 1,144)	Non-Hispanic White (n = 3,115)	Total (n = 5,876)	p
	% or mean (SD)	% or mean (SD)	% or mean (SD)		
Health behaviors					
Eye exam	79.7%	83.7%	85.5%	83.3%	b
Vegetable	95.1%	93.2%	95.8%	95.0%	c
Fruit	88.4%	92.2%	93.2%	91.5%	a,b
Check-up	96.4%	95.2%	96.9%	96.4%	
Fast food	2.17 (1.97)	1.83 (1.80)	1.62 (1.89)	1.84 (1.91)	a,b,c
Socio-demographic factors					
Age	27.85 (6.59)	26.67 (6.42)	26.56 (6.27)	26.94 (6.41)	a,b
Family size	3.15 (1.57)	3.62 (1.80)	3.18 (1.34)	3.27 (1.53)	a,c
Marriage	10.9%	15.7%	18.7%	15.6%	a,b
Higher education	10.0%	12.8%	22.2%	16.3%	b,c
Employment	57.7%	66.5%	71.0%	65.8%	a,b
Urban residence	89.0%	93.1%	76.8%	84.2%	a,b,c

Notes. ^aSignificant difference between African American and Hispanic at .05.

^bSignificant difference between African American and non-Hispanic White at .05.

^cSignificant difference between Hispanic and non-Hispanic White at .05.

Table 2. Regression Results of Unstandardized Coefficients (Standard Error), and [Standardized Coefficients] Predicting Health Behaviors—Fast Foods.

Variables	Health behaviors	
	Fast food	
	Model 1	Model 2
(Constant)	1.40 (.28)	1.43 (.28)
Race		
Hispanic	.13 (.10) [.03]	.08 (.11) [.02]
African American	.52 (.10) [.12]***	.43 (.10) [.10]***
Socioeconomic status		
Employment	.38 (.09) [.09]***	.38 (.09) [.09]***
Marriage	-.23 (.11) [-.04]*	-.22 (.11) [-.04]*
Residence (urban)	-.04 (.11) [-.01]	-.03 (.11) [-.01]
Age	.01 (.01) [.02]	.01 (.01) [.02]
Family size	-.01 (.03) [-.01]	-.01 (.03) [-.01]
Higher education	-.37 (.11) [-.07]***	-.54 (.14) [-.11]***
African American*Education		.57 (.26) [.05]*
Hispanic*Education		.24 (.27) [.02]

Note. + $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

likely to be employed, compared to non-Hispanics Whites.

Findings for Research Question 1: Does educational attainment influence health behaviors: food intake and preventive health care visits?

As presented in model 1 of Tables 2 and 3, which do not consider interaction effects, higher education was statistically associated with both food intake and preventive

health care visits. Those who received a higher levels of education were less likely to eat fast food than those who did not ($\beta = -.37, p < .001$), and were more likely to eat fruits and vegetables ($\beta = .77, OR = 2.15, p < .01$; $\beta = 6.44, OR = 1.91, p < .10$). Higher education was positively associated with routine eye exams and health check-ups ($\beta = .50, OR = 1.64, p < .01$; $\beta = 1.84, OR = 6.29, p < .01$). Racial/ethnic disparities in health behaviors were seen, in that African Americans were more likely to eat fast food than non-Hispanics Whites ($\beta = .52, p < .001$). There were no significant disparities in fast food intake between Hispanics and non-Hispanics Whites. African Americans were less likely to eat fruit compared to non-Hispanics Whites ($\beta = -.52, OR = .60, p < .01$). Hispanics had fewer opportunities to eat vegetables than non-Hispanics Whites ($\beta = -.48, OR = .62, p < .05$). In addition, African Americans were less likely to visit doctors for a routine eye exam ($\beta = -.29, OR = .75, p < .05$). Socio-demographic variables also displayed disparities among the variables. Individuals who are not currently married indicated a higher frequency of eating fast food compared to those who are married ($\beta = -.23, p < .05$). On the other hand, the employed were more likely to eat fast food ($\beta = .38, p < .001$). Old age was negatively associated with both routine eye exams and health check-ups ($\beta = -.04, OR = .96, p < .01$; $\beta = -.05, OR = .95, p < .05$). Individuals who lived in urban areas were more likely to receive a routine health check-up compared to those living in rural areas ($\beta = .66, OR = 1.94, p < .05$).

Findings for Research Question 2: Does the relationship between educational attainment and healthy behaviors differ across race/ethnicity?

As presented in Table 2 (model 2), including the moderator, interaction effects were found between education and African Americans predicting fast food intake ($\beta = .57, p < .05$). Other demographic variables, such as employment, marriage, age, family size, and residence did not moderate the association. Interestingly, as presented in Figure 1, African Americans with higher education were likely to eat more fast food compared to those without higher education, while non-Hispanic Whites and Hispanics who received a higher level of education were less likely to eat fast food compared to those without higher education (1.72 vs 1.29; 1.67 vs 1.85). Regardless of levels of education, African Americans reported a higher frequency of eating fast food in comparison with their counterparts. In addition, the gap in fast food intake between non-Hispanic Whites who received a higher level of education and African Americans who received a higher level of education is significant (2.30 vs 1.29, respectively). In terms of fruit intake, Table 3 (model 2) showed interaction effects between education and African

Table 3. Logistic Regression Coefficients (Wald) [Odds Ratio] of Predicting Health Behaviors—Eye Exam, Check-Up, Vegetables, and Fruit.

Variables	Health behaviors				
	Eye exam	Check up	Vegetables	Fruit	
				Model 1	Model 2
(Constant)	2.67 (.40)	3.91 (.76)	1.96 (.66)	2.47 (.48)	2.40 (.49)
Race					
Hispanic	-.04 (.07) [.96]	-.35 (1.44) [.70]	-.48 (4.08) [.62]*	-.11 (.30) [.58]	-.03 (.02) [.97]
African American	-.29 (4.50) [.75]*	-.03 (.01) [.97]	-.02 (.01) [.98]	-.52 (9.64) [.60]**	-.35 (4.01) [.71]*
Socioeconomic status					
Employment	.12 (.96) [1.13]	.00 (.00) [1.00]	.25 (1.55) [1.28]	-.11 (.51) [.90]	-.09 (.38) [.91]
Marriage	.04 (.06) [1.04]	.33 (.94) [1.40]	.04 (.02) [1.04]	.03 (.01) [1.03]	.01 (.00) [1.01]
Residence (urban)	.23 (2.36) [1.26]	.66 (5.88) [1.94]*	.08 (.09) [1.08]	.30 (2.52) [1.35]	.28 (2.25) [1.33]
Age					
Family size	-.04 (1.16) [.96]**	.07 (.79) [.95]*	.01 (.02) [1.03]	.02 (.25) [.99]	.03 (.28) [.99]
Higher education	.50 (8.68) [1.64]**	1.84 (9.55) [6.29]**	6.44 (3.81) [1.91]+	.77 (1.07) [2.15]**	1.55 (12.87) [4.71]***
African American*Education					
					-1.68 (9.51) [.19]**
Hispanic*Education					
					-.64 (.72) [.53]

Note. + $p < .1$ * $p < .05$. ** $p < .01$. *** $p < .001$.

Americans predicting fruit intake ($\beta = -1.68$, $OR = .19$, $p < .01$). There were no interaction effects between other socio-demographic variables and fruit intake. As presented in Figure 2, African Americans with a higher level of education tended to have fewer opportunities to eat fruit compared to those who did not received higher education. On the other hand, non-Hispanic Whites and Hispanics were more like to eat fruit if they received higher education levels. African Americans were less likely to eat fruit whether or not they attained higher education levels,

compared with non-Hispanic Whites and Hispanics. The gap of fruit intake between African Americans and non-Hispanic Whites when both attained higher education levels is significant (.98 vs .86). For eye exams, check-ups, and vegetables, interaction effects were not found.

Discussion

The findings of this study indicate empirical evidence of the relation between educational attainment and health

behaviors across men and racial/ethnic disparities in the relationships. Individuals who received higher levels of education were more likely to show health behaviors in both food intake and preventive health care visits. Furthermore, interaction effects of race/ethnicity were found: African Americans moderated the relationship between educational attainment and food intake (fast food and fruit intake).

Consistent with previous studies (e.g., Cutler & Lleras-Muney, 2010; Kimbro et al., 2008; Teixidó-Compañó et al., 2018), findings in this study indicated that educational attainment was significantly related to health behaviors. Although there has been some research investigating men's health (e.g., Mahalik et al., 2007; Ross et al., 2012), most studies have not addressed a comprehensive concept of health behaviors (e.g., Cowell, 2006; Olson et al., 2017; Walseman et al., 2018). This study classified health behaviors into two dimensions: food intake and preventive health care visits. As educational attainment influenced both dimensions, education may be one of the most important factors for individuals to sustain a healthy life (Cutler & Lleras-Muney, 2010; Teixidó-Compañó et al., 2018). During the course of their receiving higher levels of education, they might have more exposure to information about healthy living and have more opportunities to positively change their perception toward health (Cutler & Lleras-Muney, 2010; Hayward et al., 2015). Those who achieve higher educational attainment might have more chances of being hired or employed in better-paying jobs (Cutler & Lleras-Muney, 2010), which thereby enables them to meet their needs regarding life and health (Zimmerman et al., 2015). As a result, they are more likely to buy healthy food and avoid junk food, and to undertake other healthy behaviors, such as getting regular checkups (Cutler & Lleras-Muney, 2010). Specifically, as men's health characteristics showed that they pay less attention to health compared to women (Olson et al., 2017), it is critical to increase their awareness of health through education over time. Although there have been several studies examining the relationships between educational attainment and health, this study focuses on both men's food intake and preventive health care visits. That is, the findings confirm evidence that two dimensions in supporting men's health are facilitated by higher education.

Findings from this study reveal racial/ethnic disparities in health behaviors across men and the moderating effects of race/ethnicity in the relationships between their educational attainment and health behaviors. Consistent with previous research (Dubowitz et al., 2011), African American men reported that they were less likely to eat fruit while

being more likely to eat fast food in comparison with non-Hispanic Whites. Generally, African Americans tend to have fewer economic resources and have a lower socioeconomic status (Hughes et al., 2014). This may influence the tendency to have poor health behaviors as it relates to less healthy food intake and fewer preventive health care visits. Within the two dimensions in health behaviors, food intake and preventive health care visits, interaction effects were found between educational attainment and African Americans predicting food intake. African Americans moderate the relations between educational attainment and fast food and fruit intake. Compared to African Americans, non-Hispanic Whites with higher education were less likely to eat fast food and more likely to eat fruit. Interestingly, African Americans who attained a higher educational engaged in more frequent fast food eating and less frequent fruit intake. Even when African Americans have attained the highest educational achievement, job discrimination is still evident among them (Bertrand & Mullainathan, 2004), which may explain the contradictory correlations between higher educational attainment and access to healthy food. Another possible reason for this moderating effect is that fast food restaurants are predominately likely to be located in neighborhoods where African Americans are concentrated, compared to neighborhoods with a higher concentration of non-Hispanic Whites, even after controlling for socioeconomic factors such as household income (Block et al., 2004). This indicates that African American men could have more convenient access to fast food, which likely leads to a higher intake of fast food. This study suggests that future research needs to take environmental factors that might affect greater consumption of fast food among African Americans into account, noting that a higher prevalence of obesity is a significant health risk among African Americans (U.S. Department of Health and Human Services Office of Minority Health, 2018). Likewise, findings in this study identified racial/ethnic disparities in employment. In other words, African American men may experience difficulties in finding a job and earning a living wage (Western et al., 2012). As a result, they may focus more on saving money than investing time and resources for one's health and self-development, even if they are employed. African American men may be employed in a relatively poor workplace or encounter racial/ethnic discrimination in their workplace in comparison with their counterparts (Hughes et al., 2014), leading them toward unhealthy behaviors. For instance, African American men may have a bigger workload and more frequent burnout compared to non-Hispanic Whites. That is, discrimination may occur in the workplace (Bertrand & Mullainathan, 2004), and the inequality may influence productivity and quality of life among African Americans because they may not be able to take care of themselves.

Limitations and Implications

The findings in this study should be interpreted in the context of limitations. One potential limitation might be the variables to measure preventive health care visits. Since secondary data were used in this study and there are a limited number of variables in the data set, potentially important measures for preventive health care visits (e.g., dental scaling) were not considered in the current study. We recommend that other preventive health care visit measures should be taken into account in future studies. Second, although we contribute to a cross-sectional approach in the relationship between educational attainment and health behaviors among young adult men and understanding the moderating effects of race/ethnicity, this research cannot explore causal effects of educational attainment on health behaviors. Thus, a future study should leverage longitudinal data to investigate the effects based on longitudinal settings. Third, health behaviors measured in this study were administered by self-report. Social desirability bias may occur when respondents reported their health behaviors, prompting respondents to pretend to have more positive behaviors. Thus, the self-reported responses might limit the interpretation of the findings. Fourth, educational attainment was classified into two categories: higher education and non-higher education. However, we suggest that future studies consider intermediate levels of education to identify differences across the three groups. Lastly, this study focused on making comparisons among three groups: non-Hispanic Whites, African Americans, and Hispanics. However, we recommend that future studies take into account whether health behaviors differ by education level within each racial/ethnic group.

Although this study has several limitations, the findings contribute to understanding men's health behavior and the role of educational attainment. Health behaviors among young adult men are influenced by educational attainment. Since achieving a higher degree of education affects a healthy lifestyle by encouraging people to eat more healthy food and have more frequent preventive health care visits, providing an equal opportunity for education is important for men to maintain their health during young adulthood. However, given that African American men with higher education still eat fast food more frequently and fruitless frequently than their counterparts, this newly recognized health behavior leads to further research questions regarding why they reported the opposite health behaviors compared to non-Hispanic White men. The phenomenon should be interpreted in a context of discrimination and neighborhoods, as discussed above. This implies that education itself should provide more content concerning how to improve health behaviors among young adult African American men. In

addition, African American men may be more influenced by environmental factors compared to their counterparts so that additional factors should be considered to understand their health behaviors. Overall, this study contributes to understanding racial/ethnic disparities in the relationship between educational attainment and health behaviors. The findings shed light on the importance of education in health behaviors among young adult men by considering two different dimensions: food intake and preventive health care visits.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Jaewon Lee  <https://orcid.org/0000-0001-9990-1893>

References

- Arendt, J. N. (2005). Does education cause better health? A panel data analysis using school reforms for identification. *Economics of Education Review, 24*(2), 149–160.
- Baker, C. W., Little, T. D., & Brownell, K. D. (2003). Predicting adolescent eating and activity behaviors: The role of social norms and personal agency. *Health Psychology, 22*(2), 189–198.
- Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *The American Economic Review, 94*(4), 991–1013.
- Block, J. P., Scribner, R. A., & DeSalvo, K. B. (2004). Fast food, race/ethnicity, and income: A geographic analysis. *American Journal of Preventive Medicine, 27*(3), 211–217.
- Courtenay, W. H. (2000). Behavioral factors associated with disease, injury, and death among men: Evidence and implications for prevention. *The Journal of Men's Studies, 9*(1), 81–142.
- Cowell, A. J. (2006). The relationship between education and health behavior: Some empirical evidence. *Health Economics, 15*(2), 125–146.
- Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of Health Economics, 29*(1), 1–28.
- Cunningham, T. J., Croft, J. B., Liu, Y., Lu, H., Eke, P. I., & Giles, W. H. (2017). Vital signs: Racial disparities in age-specific mortality among Blacks or African Americans—United States, 1999–2015. *Morbidity and Mortality Weekly Report, 66*(17), 444–456.
- Dubowitz, T., Heron, M., Basurto-Davila, R., Bird, C. E., Lurie, N., & Escarce, J. J. (2011). Racial/ethnic differences in US health behaviors: A decomposition analysis. *American Journal of Health Behavior, 35*(3), 290–304.

- Harris, K. M., Gordon-Larsen, P., Chantala, K., & Udry, J. R. (2006). Longitudinal trends in race/ethnic disparities in leading health indicators from adolescence to young adulthood. *Archives of Pediatrics & Adolescent Medicine, 160*(1), 74–81.
- Hayward, M. D., Hummer, R. A., & Sasson, I. (2015). Trends and group differences in the association between educational attainment and US adult mortality: Implications for understanding education's causal influence. *Social Science & Medicine, 127*, 8–18. doi:10.1016/j.socscimed.2014.11.024
- Hughes, M., Kiecolt, K. J., & Keith, V. M. (2014). How racial identity moderates the impact of financial stress on mental health among African Americans. *Society and Mental Health, 4*(1), 38–54.
- Jackson, J. S., Knight, K. M., & Rafferty, J. A. (2010). Race and unhealthy behaviors: Chronic stress, the HPA axis, and physical and mental health disparities over the life course. *American Journal of Public Health, 100*(5), 933–939.
- Kimbro, R. T., Bzostek, S., Goldman, N., & Rodríguez, G. (2008). Race, ethnicity, and the education gradient in health. *Health Affairs, 27*(2), 361–372.
- Mahalik, J. R., Burns, S. M., & Syzdek, M. (2007). Masculinity and perceived normative health behaviors as predictors of men's health behaviors. *Social Science & Medicine, 64*(11), 2201–2209.
- Montez, J. K., Hummer, R., & Hayward, M. (2012). Educational attainment and adult mortality in the United States: A systematic analysis of functional form. *Demography, 49*(1), 315–336.
- Olson, J. S., Hummer, R. A., & Harris, K. M. (2017). Gender and health behavior clustering among US young adults. *Biodemography and Social Biology, 63*(1), 3–20.
- Ross, C. E., Masters, R. K., & Hummer, R. A. (2012). Education and the gender gaps in health and mortality. *Demography, 49*(4), 1154–1183.
- Saint Onge, J. M., & Krueger, P. M. (2017). Health lifestyle behaviors among U.S. Adults. *SSM Population Health, 3*, 89–98.
- Schiller, J. S., Lucas, J. W., & Peregoy, J. A. (2012). *Summary health statistics for US adults: National health interview survey, 2011*. <https://stacks.cdc.gov/view/cdc/21423>
- Short, S. E., & Mollborn, S. (2015). Social determinants and health behaviors: Conceptual frames and empirical advances. *Current Opinion in Psychology, 5*, 78–84.
- Teixidó-Compañó, E., Espelt, A., Sordo, L., Bravo, M. J., Sarasa-Renedo, A., Indave, B. I., Bosque-Prous, M., & Brugal, M. T. (2018). Differences between men and women in substance use: The role of educational level and employment status. *Health Gazette, 32*(1), 41–47.
- The Office of Disease Prevention and Health Promotion. (2019). *Social determinants of health*. <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>
- U.S. Department of Health and Human Services Office of Minority Health. (2018). *Obesity and African Americans*. <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=25>
- Walsemann, K. M., Hummer, R. A., & Hayward, M. D. (2018). Heterogeneity in educational pathways and the health behavior of US young adults. *Population Research and Policy Review, 37*(3), 343–366.
- Western, B., Bloome, D., Sosnaud, B., & Tach, L. (2012). Economic insecurity and social stratification. *Annual Review of Sociology, 38*(1), 341–359.
- Zimmerman, E. B., Woolf, S. H., & Haley, A. (2015). *Population health: Behavioral and social science insights: Understanding the relationship between education and health*. <http://www.ahrq.gov/professionals/education/curriculum-tools/polulation-health/zimmerman.html>