Cognitive features of self-stigmatization among juvenile delinquents

Journal of Health Disparities Research and Practice

Volume 8
Issue 2 *General Issue Summer 2015*

Article 4



2014

# Cognitive features of self-stigmatization among juvenile delinquents

Artyom A. Zinchenko , *Max-Plank Institute for Human Cognitive and Brain Sciences*, artyom.zinchenko@gmail.com

Mamun Al-Amin

Elena Molchanova , *American University Central Asia, Bishkek, Kyrgyzstan*

# Cognitive features of self-stigmatization among juvenile delinquents


## Abstract

The present study investigates cognitive features of stigmatization phenomenon among juvenile delinquents in Kyrgyzstan. It attempts to describe certain peculiarities of juvenile delinquents' self-schemas and self-stigmatization. The study, additionally, tackles the issue of currently existing stigmas regarding juvenile delinquency in the country. One hundred and fifty four university students were asked to complete a questionnaire that would measure the level of external stigmatization towards juvenile delinquents and those who were once placed into correctional institution. Students showed presence of stigmatization towards people with a criminal record. Fifteen juveniles from the detention school who attended a socio-psychological training as well as eighteen delinquent juveniles who attended the same detention school, but did not have any training, were asked to complete semantic differential self-questionnaires that measured the level of internal stigmatization. It was found that delinquent juveniles in Kyrgyzstan self stigmatize, when compared to the control group of fifty four non-delinquent juveniles, who attended a regular school. However, there was a trend towards positive effect of the socio-psychological training that was intended to develop delinquents' social skills. Since self-stigmatization was shown to influence the process of rehabilitation and social adaptation, it might become one of the major obstacles for successful rehabilitation and re-integration of juvenile delinquents into society after graduation from the detention school. Our study, therefore, argues for the high need of specialized socio-psychological training program for juvenile delinquents.



## Keywords

self-stigmatization; stigma; juvenile delinquents

**Journal of Health Disparities Research and Practice**
**Volume 8, Issue 2, Summer 2015, pp. 61-74**

School of Community Health Sciences
University of Nevada, Las Vegas

# Modeling BMI, Dietary Habits, and Physical Activity among Ethnically Diverse Urban College Students

Hollie Jones, PhD, Medgar Evers College
Nicholas Freudenburg, DrPH, Hunter College
Lorraine Mongiello, DrPH, New York Institute of Technology

## ABSTRACT

Objectives: The objective of this research study was to examine the relationship between BMI, physical activity, dietary habits, and student demographic factors (age, ethnicity, income, immigration, and sex). Given the association between overweight and obesity and the inequitable burden of chronic health conditions among ethnic minority populations, a deeper understanding of the socioeconomic, gender, age, and racial/ethnic variation in BMI, physical activity, and dietary habits is needed. The shifting demographics of urban college populations make urban college campuses an important setting for addressing the lifetime health needs of ethnically diverse urban populations.

Methods: In this cross-sectional non-experimental study, we used validated self-report questionnaires to survey 1,184 students about their dietary habits, physical activity, and BMI. Measures included self-reported dietary habits, physical activity, BMI and demographics (age, ethnicity, income, immigrant status, and sex).

Results: Hispanics and Non-Hispanic Blacks were more likely to be at higher risk for increased BMI, less weekly hours of physical activity, and more unhealthy dietary habits. Female students were at a higher risk of less weekly physical activity. Older age was associated with increased BMI and more healthy dietary habits. Students attending colleges with a predominantly Hispanic student population (Campus B) and a predominantly Black student population (Campus C) had significantly higher BMIs than those attending an ethnically diverse college (Campus A). Immigrants had a lower average BMI and reported consuming less unhealthy foods than non-immigrants. In addition, immigrants from Europe and Asia had a lower BMI and engaged in more healthy dietary habits when compared to immigrants from the Caribbean, Africa, and Central and South America.

Conclusions: Researchers, health interventionists, and college health professionals should continue to target and tailor interventions for all college students with an emphasis on non-Hispanic Black, Hispanic, and other students at risk for ill health associated with BMI, physical inactivity, and poor dietary habits. In addition, interventions should be targeted to help immigrant students maintain health practices that may be protective.

**Keywords:** Ethnic minority health, health disparities, physical activity, obesity, immigration, dietary habits

## INTRODUCTION

It has been widely acknowledged that the recent increase in the prevalence of obesity threatens the health of all Americans, in particular, those living in low income and underserved communities. Obesity contributes to type-2 diabetes, cardiovascular disease, and cancer. Most observers agree that chronic disease presents great threats to the American people and its health care system, where no measure would more effectively reduce the future burden of chronic diseases than lowering obesity rates and shrinking current inequalities in the prevalence of obesity.

While attention has been focused on obesity among children and adults, young adults between the ages of 18 and 24 have received less attention. This research study examined the intersection of two trends: the increasing number of young adults in college in the United States (Pew Research Center, 2009; US Census Bureau, 2009; U.S. Department of Education, National Center for Education Statistics, 2013), particularly young adults from disadvantaged backgrounds, and the rising rates of obesity and overweight among this population. Data collected from students attending a large urban public university were used to consider the obesity challenge facing young adults in American universities, as well as to suggest strategies for reducing unhealthy behaviors among college students from various ethnic backgrounds.

In the last few decades, two major trends transformed the challenges facing colleges and universities charged with protecting the health of their students. First, the demographic composition of university students has changed significantly, from mostly White middle class students to a more ethnically diverse mix, better reflecting the nation's population as a whole (US Census Bureau, 2012). Second, young adults, like other age groups, have experienced growing rates of overweight and obesity, putting them at higher lifetime risk of diabetes, other chronic health conditions, and poor quality of life (Helajärvi et al., 2014; Kozak et al., 2011; Liu et al., 2010; Pratt, Lazorick, Lamson, Ivanescu, & Collier, 2013).

In the last 35 years, the profile of who goes to college in the United States has shifted tremendously. The number of ethnic minorities attending college has more than doubled; ethnic minorities now represent about one-third of the entire college student body. In 2008, 55% of high school graduates in the two lowest income quintiles started college compared to only 36% in 1984 (U.S. Department of Education, 2009). In addition, college and university enrollment has steadily grown over the past two decades, reaching 19.6 million in fall 2009. It is expected to increase an additional 17% by 2014 (National Center for Education Statistics, n.d.), a rate of increase higher than the rise in the college-age population as a whole (United States Department of Labor, 2010). Since 1970, the percentage of young people aged 16 to 24 enrolled in institutions of higher education increased by 150%, from 25.7% to 38.8% (National Center for Education Statistics, 2008). Moreover, data from the National Student Clearinghouse Research Center (2013) show that urban (as compared to rural or suburban) colleges enrolled the largest number of college students and urban populations have the highest rates of college enrollment; suggesting that colleges may be an important site for promoting the health of urban young adults.

A significant portion of the increase can be attributed to the growth of community colleges, whose enrollment has increased more than sevenfold since 1963, the largest increase in any sector of university students (U.S. Department of Education, 2011). In fall 2006, more than 6.2 million students, 35% of all postsecondary students, were enrolled in community colleges across the country. These changes make college campuses an important setting for addressing the lifetime health needs of young adults (Centers for Disease Control and Prevention, 2014a, 2009; Freudenberg, Manzo, Mongiello, Jones, & Lamberson, 2013) and provide new

opportunities for reducing the disparities in weight-related health conditions between wealthy and poor Americans, as well as between Whites and Blacks, Hispanics, and other racial/ethnic groups (Katz, O'Connell, Njike, Yeh, & Nawaz, 2008).

A specific health challenge facing today's college population is overweight and obesity. According to the American College Health Association Student Health Survey (2014), 35% of college students were overweight or obese (according to CDC standards). Furthermore, up to 70% of students gain weight during the first 3 years of college (Gropper, Simmons, Connell, & Ulrich, 2012). Rates of overweight and obesity were higher in females than males and in Blacks than Whites. While several reports described the dimensions of obesity on college campuses (American College Health Association, 2014; Desai, Miller, Staples, & Bravender, 2008), only a few analyzed differences in rates among the more diverse populations now enrolled on campuses (Kasparek, Sargent, & Morris, 2008). Given the close association between the rise in overweight and diabetes in the United States and the inequitable burden of diabetes on low income and Black and Hispanic adolescents and adults (Hasson et al., 2013; Selvin, Parrinello, Sacks, & Coresh, 2014), a deeper understanding of the socioeconomic, gender, age and racial/ethnic variation in body weight, physical activity, and dietary habits among college students is necessary to develop new strategies to prevent obesity and its sequelae of diet-related chronic conditions.

In this paper, the results of a study of an ethnically diverse sample of undergraduate students are summarized. In spring of 2010, this large urban university system enrolled 260,000 undergraduate students and 269,808 adult, continuing and professional education students at its 23 campuses throughout New York City. Of the enrolled undergraduate students, 61% enrolled in four year schools and 39 % in community colleges; 28.7% were Hispanic, 27.7% were Black, 26.1% were White, 17.2% were Asian or Pacific Islander and 0.2% were American Indian or Native American. Almost 60% were female; 43% were born outside the U.S. mainland, and 24% were 25 years and older. Students speak 165 languages and one-third of students have household incomes of less than $20,000 per year. More than two-fifths (41%) were the first generation in their family to attend college. In addition, 14% were supporting children and 42% worked for pay more than 20 hours per week. In many ways, this university system reflects the changing demographics of US college students, especially those living in urban areas.

## METHODS

The study served as a needs assessment for university-wide initiatives to improve student health with a focus on dietary and physical activity-related health conditions. For this convenience sample, we surveyed students at three colleges, selected for their geographic, ethnic/racial, and academic diversity. The three colleges included a four year college that enrolls 20,000 ethnically diverse predominantly female (70%) students from neighborhoods around the city (Campus A); a community college with a predominantly female (65%) and Hispanic (60%) population (Campus B); and a four year college with a predominantly female (75%) and Black (94%) student population (Campus C). These colleges were chosen because of their location and student population. Many of the students who attend these colleges live in neighborhoods with a high prevalence of obesity and diabetes.

The Principal Investigators conducted personal outreach to faculty members of each of the three campuses and personally invited faculty from various departments to invite their students to complete the survey. Faculty who expressed interest allowed the survey to be administered by trained research assistants before or after a scheduled class or during a class

break. Faculty chose a date and time for survey administration that was most convenient to them and key research personnel distributed and collected the survey from students at the time specified by faculty (before or after class or during a class break). Students who were not interested in completing the survey chose to leave the room or continue with their break. The survey administration did not take away from instructional time. Faculty and students were made aware that student participation was not mandatory and that and lack of interest or participation would bear no consequences for them or their students. The university-wide IRB approved the study. In this report, we present findings on students' dietary habits, physical activity, and BMI, as well as the relationship between these variables and age, ethnicity, income, immigration, sex, and campus (Campus A, B, or C).

Measures

The survey assessed participants' background characteristics such as age, ethnicity, income, marital status, height, and weight. The categories for ethnicity included non-Hispanic Blacks, non-Hispanic Whites, Hispanic and Asian/Pacific Islanders. Socioeconomic standing was assessed through inquiry about the prior year's annual household income.

*Dietary habits*. Dietary habits were assessed with 2 measures: a healthy dietary habits scale and an unhealthy dietary habits scale. The Healthy Dietary Habits and Unhealthy Dietary Habits Scales were developed using the USDA guidelines for 5 fruits and vegetables per day as a basis (Freedman, 2011).

The Healthy Dietary Habits Scale assessed weekly consumption of fruits, vegetables, and whole grains with 3 items measured using a 6-point scale (0 = never to 6 = 3 or more time per day) and responses were averaged to arrive at a final score. The scale had an alpha of .72. Higher scores indicated eating more fruit, vegetables, and whole grains weekly.

The Unhealthy Dietary Habits Scale assessed weekly consumption of high fat foods, fast food, pastries, and sweetened beverages with 5 items (i.e., eating food cooked outside the home, eating high fat foods, desserts, food from vending machines, and eating fast food). The items were measured using a point 4-point scale (0 = never to 4 = very often) and responses were averaged to arrive at a final score. The scale had an alpha of .71. Higher scores indicated greater weekly consumption of high fat foods, fast food, pastries, and sweetened beverages.

*Physical activity*. Physical activity was measured with 2 items assessing the number of hours per week students reported engaging in physical activity such as walking, jogging, dancing, running, bicycling, weight training, or any other activities which caused at least light sweating or a slight increase in breathing. The items were measured using a 6-point scale (0 = none to 6 = greater than 6 hours) and responses were averaged to arrive at a final score. The physical activity assessment was developed by the research team based on The Centers for Disease Control and Prevention (2014c) recommendations that adults engage in 150 minutes of moderate intensity aerobic activity weekly, 75 minutes of vigorous-intensity aerobic activity, or muscle strengthening activities, for 2 or more days each week.

*BMI*. BMI was measured using self-reported height and weight. BMI was calculated using the following formula: BMI= (weight in pounds) divided by (height in inches squared) times 703 (Centers for Disease Control and Prevention, 2014c; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). Developed by the National Heart, Lung, and Blood Institute (NHLBI) and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the formula is consistent with federal guidelines on the identification of overweight and obesity.

Participants

Study participants included students 18 years or older from three colleges. Students were invited to participate from classes that enrolled large numbers of students, from many disciplines, and in places where students congregated. Students were told that their involvement in the study was completely voluntary and that refusing to participate would not affect their relationship to the college or their grades. The requirement that students sign the consent form was waived to protect student confidentiality. Research personnel distributed and collected the survey from interested students at specified times either in classrooms, research labs, or in cafeterias and other settings. All students over the age of 18 could complete the survey, irrespective of full or part-time student status. The survey took no more than 40 minutes to complete. Upon completion of the survey, all students were given a list of free and low-cost healthcare providers in the geographic area.

The final sample with complete data consisted of 1,184 student respondents from three CUNY campuses. As shown in Table 1, more than half of the students were from Campus A (58.5%). The study sample was predominantly female (73.1%) and between the ages of 18 and 25 (75.5%). The demographic profile of the sample resembled the CUNY student population, with the exception that this sample had a higher proportion of females (73% vs. 59%). About two in five (41.4%) respondents reported being a first generation immigrant. The largest racial/ethnic group represented in the sample was non-Hispanic Blacks, comprising 35.7% of the sample. This was followed by Hispanics (27.4%). Non-Hispanic White respondents accounted for 18.8% of the sample. Only 18.1% of the sample consisted of Asians and Pacific Islanders. Two thirds of the sample reported an annual household income of less than $40,000 and one-third reported incomes above that level.

Table 1: Frequencies and Percentages for the Demographic Variables (N = 1184)

| Variable | *n* | % |
|---|---|---|
| Gender | | |
| Male | 318 | 26.9 |
| Female | 866 | 73.1 |
| Age | | |
| 18 to 25 | 894 | 75.5 |
| Over 25 | 290 | 24.5 |
| Ethnicity | | |
| Non-Hispanic White | 222 | 18.8 |
| Non-Hispanic Black | 423 | 35.7 |
| Hispanic | 325 | 27.4 |
| Asian and Pacific Islander | 214 | 18.1 |
| Income | | |
| < $40,001 | 785 | 66.3 |
| > $40,000 | 399 | 33.7 |
| First Generation Immigrant | | |
| No | 694 | 58.6 |
| Yes | 490 | 41.4 |
| Campus | | |
| Campus A | 693 | 58.5 |
| Campus B | 217 | 18.3 |
| Campus C | 274 | 23.1 |

## RESULTS

We assessed the association between demographics (i.e., age, gender, ethnicity, income, immigrant status, and campus) and BMI, dietary habits, and physical activity. Descriptive statistics, displayed in Table 2, were calculated for the interval-level variables. BMI ranged from 12.36 to 58.57 with an average BMI of 24.56 (*SD* = 5.48). Weekly physical activity ranged from zero to five hours with an average of 2.64 hours (*SD* = 1.33). Healthy diet scores ranged from zero to six with an average of 2.17 (*SD* = 1.16) thus indicating that students ate healthy food three to four times per week. Unhealthy diet scores ranged from zero to four, with an average of 1.75 (*SD* = .61); therefore, students rarely or sometimes ate unhealthy food each week.

Table 2: Descriptive Statistics for the Study Variables (N = 1184)

| Variable | Range | *M* | *SD* |
|---|---|---|---|
| BMI | 12.36 to 58.57 | 24.56 | 5.48 |
| Hours of weekly physical activity | .00 to 5.00 | 2.64 | 1.33 |
| Healthy dietary habits | | | |
| Unhealthy dietary habits | .00 to 6.00 | 2.17 | 1.16 |
| | .00 to 4.00 | 1.75 | .61 |

Simultaneous multiple regression analyses were conducted to determine the relationship between demographic factors, BMI, physical exercise, healthy eating habits, and unhealthy eating habits. Prior to interpreting the regression results, multi-collinearity was assessed by checking the Tolerance values of the predictors. Multi-collinearity was not an issue given that tolerance values were above .20 (Cohen, Aiken, & West, 2004).

Relationship between Student Demographic Factors and BMI

The demographic model significantly predicted BMI, $F(9, 1174) = 23.80$, $p < .001$. But it only accounted for 15.4% of the variance in BMI. Students' age significantly predicted BMI, $p < .001$; the mean BMI for students between 18 and 25 (*M* = 23.74, *SD* = 4.96) was significantly lower than the mean BMI for students 26 years or older (*M* = 27.15, *SD* = 6.24). Students' race also significantly predicted BMI. In particular, the mean BMI for non-Hispanic White students was significantly lower (*M* = 22.58, *SD* = 3.62) than the mean BMI for non-Hispanic Black students (*M* = 26.44, *SD* = 6.60; $p < .001$) and Hispanic students (*M* = 24.92, *SD* = 4.92; $p < .05$). In addition, immigrant status significantly predicted BMI, $p < .01$; the mean BMI for non-immigrants was significantly higher (*M* = 24.62, *SD* = 5.73) than the mean BMI for immigrant students (*M* = 24.51, *SD* = 5.16). Finally, campus significantly predicted BMI. Specifically, the mean BMI for Campus A students was significantly lower (*M* = 22.99, *SD* = 4.26) than the mean BMI for Campus B students (*M* = 26.68, *SD* = 5.74; $p < .001$) and Campus C students (*M* = 26.84, *SD* = 6.58; $p < .001$).

Table 3: Multiple Linear Regression Results for the Relationship between Student Demographics and BMI (N = 1184)

| Variable | *B* | *SE* | *β* | |
|---|---|---|---|---|
| Age (18 to 25 vs. older than 25) | 2.08 | .39 | .16 | *** |
| Gender (male vs. female) | -.34 | .34 | -.03 | |
| Race | | | | |
| Non-Hispanic White vs. Non-Hispanic Black | 2.05 | .52 | .18 | *** |
| Non-Hispanic White vs. Hispanic | 1.15 | .48 | .09 | * |
| Non-Hispanic White vs. Asian or Pacific Islander | -.02 | .50 | -.00 | |
| Income ($40,000 or less vs. $40,001 or more) | -.37 | .34 | -.03 | |
| Immigrant (non-immigrant vs. immigrant) | -.81 | .31 | -.07 | ** |
| Campus | | | | |
| Campus A vs. Campus B | 2.01 | .49 | .14 | *** |
| Campus A vs. Campus C | 1.79 | .51 | .14 | *** |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Relationship between Demographic Factors and Hours of Weekly Physical Activity

The demographic model significantly predicted physical activity, $F(9, 1174) = 13.23$, $p < .001$. But it only accounted for 9.2% of the variance in physical activity. Students' gender significantly predicted physical activity, $p < .001$; the mean number of hours that male students spent on physical activity ($M = 3.13$, $SD = 1.34$) was significantly higher than the mean number of hours female students spent on physical activity ($M = 2.46$, $SD = 1.29$). Students' race also significantly predicted physical activity. In particular, the mean number of hours that non-Hispanic White students spent on physical activity was higher ($M = 2.98$, $SD = 1.23$) than the mean number of hours Asian students spent on physical activity ($M = 2.50$, $SD = 1.34$; $p < .001$). In addition, immigrant status significantly predicted physical activity, $p < .001$; the mean number of hours non-immigrants spent on physical activity was significantly higher ($M = 2.81$, $SD = 1.30$) than the number of hours immigrants spent on physical activity ($M = 2.40$, $SD = 1.35$). Finally, campus significantly predicted physical activity. Specifically, the mean number of hours Campus A students spent on physical activity was significantly higher ($M = 2.79$, $SD = 1.30$) than the mean number of hours Campus B students spent on physical activity ($M = 2.47$, $SD = 1.36$; $p < .05$).

Table 4: Multiple Linear Regression Results for the Relationship between Student Demographics and Physical Activity (N = 1184)

| Variable | *B* | *SE* | *B* | |
|---|---|---|---|---|
| Age (18 to 25 vs. older than 25) | .13 | .10 | .04 | |
| Gender (male vs. female) | -.64 | .09 | -.21 | *** |
| Race | | | | |
| Non-Hispanic White vs. Non-Hispanic Black | -.18 | .13 | -.06 | |
| Non-Hispanic White vs. Hispanic | -.10 | .12 | -.03 | |
| Non-Hispanic White vs. Asian or Pacific Islander | -.42 | .13 | -.12 | *** |
| Income ($40,000 or less vs. $40,001 or more) | .16 | .09 | .06 | |
| Immigrant (non-immigrant vs. immigrant) | -.31 | .08 | -.11 | *** |
| Campus | | | | |
| Campus A vs. Campus B | -.29 | .12 | -.08 | * |
| Campus A vs. Campus C | -.22 | .13 | -.07 | |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Relationship between Demographic Factors and Healthy Dietary Habits

The demographic model significantly predicted healthy eating (weekly consumption of fruit, vegetables, and whole grains), $F(9, 1174) = 12.12$, $p < .001$. But it only accounted for 8.5% of the variance in healthy eating. Students' age significantly predicted healthy eating, $p < .001$; younger students' average weekly consumption of healthy foods ($M = 2.14$, $SD = 1.16$) was significantly lower than that of older students ($M = 2.26$, $SD = 1.14$). Students' race also significantly predicted healthy eating. In particular, non-Hispanic White students' average weekly consumption of healthy foods was higher ($M = 2.59$, $SD = 1.31$) than non-Hispanic Black students' ($M = 1.93$, $SD = 1.10$; $p < .001$) and Hispanic students' ($M = 2.01$, $SD = 1.08$; $p < .001$) average weekly consumption of healthy foods. Students' income significantly predicted healthy eating. The average weekly consumption of healthy foods was higher for those making more than $40,000 per year ($M = 2.40$, $SD = 1.27$) as compared to those making $40,000 or less ($M = 2.05$, $SD = 1.08$; $p < .001$. Finally, campus significantly predicted healthy eating. Specifically, the average weekly consumption of healthy foods was higher for Campus A students ($M = 2.33$, $SD = 1.20$) as compared to Campus B students' average weekly consumption of healthy foods ($M = 1.95$, $SD = .99$; $p < .05$).

Table 5: Multiple Linear Regression Results for the Relationship between Student Demographics and Healthy Dietary Habits (N = 1184)

| Variable | B | *SE* | B | |
|---|---|---|---|---|
| Age (18 to 25 vs. older than 25) | .35 | .09 | .13 | *** |
| Gender (male vs. female) | .06 | .07 | .02 | |
| Race | | | | |
| Non-Hispanic White vs. Non-Hispanic Black | -.62 | .12 | -.25 | *** |
| Non-Hispanic White vs. Hispanic | -.47 | .11 | -.18 | *** |
| Non-Hispanic White vs. Asian or Pacific Islander | -.07 | .11 | -.02 | |
| Income ($40,000 or less vs. $40,001 or more) | .27 | .07 | .11 | *** |
| Immigrant (non-immigrant vs. immigrant) | .13 | .07 | .06 | |
| Campus | | | | |
| Campus A vs. Campus B | -.22 | .11 | -.07 | * |
| Campus A vs. Campus C | -.06 | .11 | -.02 | |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Relationship between Demographic Factors and Unhealthy Dietary Habits

The demographic model significantly predicted unhealthy eating (weekly consumption of high fat foods, fast food, pastries, and sweetened beverages), $F(9, 1174) = 8.39$, $p < .001$. But it only accounted for 6% of the variance in unhealthy eating. Students' age significantly predicted unhealthy eating, $p < .001$; younger students' average weekly consumption of unhealthy foods ($M = 1.82$, $SD = .59$) was significantly higher than older students' average weekly consumption of unhealthy foods ($M = 1.52$, $SD = .60$). In addition, students' immigration status significantly predicted unhealthy eating, $p < .05$; non-immigrant students' average weekly consumption of unhealthy foods was higher ($M = 1.81$, $SD = .60$) than the immigrant students' average weekly consumption of unhealthy foods ($M = 1.67$, $SD = .61$; $p < .05$).

Table 6: Multiple Linear Regression Results for the Relationship between Student Demographics and Unhealthy Dietary Habits (N = 1184)

| Variable | *B* | *SE* | *B* | |
|---|---|---|---|---|
| Age (18 to 25 vs. older than 25) | -.30 | .05 | -.21 | *** |
| Gender (male vs. female) | .07 | .04 | .05 | |
| Race | | | | |
| Non-Hispanic White vs. Non-Hispanic Black | .09 | .06 | .08 | |
| Non-Hispanic White vs. Hispanic | .10 | .06 | .08 | |
| Non-Hispanic White vs. Asian or Pacific Islander | .01 | .06 | .01 | |
| Income ($40,000 or less vs. $40,001 or more) | | | | |
| Immigrant (non-immigrant vs. immigrant) | .05 | .04 | .04 | |
| Campus | -.08 | .04 | -.06 | * |
| Campus A vs. Campus B | | | | |
| Campus A vs. Campus C | -.04 | .06 | -.02 | |
| | .00 | .06 | .00 | |

* $p < .05$. ** $p < .01$. *** $p < .001$.

Exploratory Analyses with the Immigrant Student Sample

Of the 490 first generation immigrants in the sample, 489 indicated their country of origin, which we further classified by region. Approximately 42.3% ($n$ = 207) were from Caribbean islands, 20.2% ($n$ = 99) were from countries in Asia, 13.5% ($n$ = 66) were from Central and South America, 13.9% ($n$ = 68) were from Europe, 5.7% ($n$ = 28) were from Africa, 3.7% ($n$ = 18) were from the Middle East, and .6% ($n$ = 3) were from Canada. ANOVA procedures with Tukey Post hoc tests were conducted to determine whether BMI, physical activity, and healthy dietary habits differed across these groups. The findings revealed that the immigrant groups' BMI differed significantly, $F(6, 482) = 12.36$, $p < .001$. Immigrants from the Caribbean ($M$ = 25.98, $SD$ = 5.69), Africa ($M$ = 25.43, $SD$ = 5.91), and Central and South America ($M$ = 26.08, $SD$ = 4.93) had significantly higher BMIs than those from Asia ($M$ = 22.05, $SD$ = 3.55) and Europe ($M$ = 22.05, $SD$ = 2.83).

In addition, there were statistically significant differences in healthy dietary habits, $F(6, 482) = 7.59$, $p < .001$. Immigrants from Europe ($M$ = 2.82, $SD$ = 1.39) and Asia ($M$ = 2.60, $SD$ = 1.07) had significantly higher average weekly consumption of healthy foods than those from the Caribbean ($M$ = 1.99, $SD$ = 1.14), Africa ($M$ = 1.83, $SD$ = 0.77), and Central and South America ($M$ = 2.03, $SD$ = 1.05). There were no statistically significant mean differences in physical activity habits, $F(6, 482) = 2.09$, $p > .05$.

## DISCUSSION

In comparison to non-Hispanic Whites, being Hispanic or non-Hispanic Black was consistently associated with increased BMI, less weekly physical activity, and less healthy dietary habits among this college sample. These findings were consistent with the literature, which continues to show that non-Hispanic Blacks and Hispanic populations have health characteristics that are associated with increased risk for obesity and chronic disease (Romero, Romero, Shlay, Ogden, & Dabelea, 2012; Selvin et al., 2014; St-Onge et al., 2010). In addition, we found that students attending Campus B and Campus C had significantly higher BMIs than those attending Campus A. In addition, Campus A students engaged in more weekly physical activity and engaged in more healthy dietary habits than students attending Campus B and Campus C. Students from Campus B and C were predominantly Hispanic and non-Hispanic Black.

While gender has been shown to be associated with BMI in studies (Chang, Pollack, & Colditz, 2013; St-Onge et al., 2010), gender was not associated with BMI in this multi-racial sample of urban college students. In addition, gender was not significantly associated with unhealthy or health dietary habits. However, being female was associated with a significant decrease in weekly physical activity. This general lack of gender differences in many of our dependent variables is consistent with studies on this topic (Ping, Chaudhari, & Antal, 2010). The lack of consensus regarding the role of gender in health-related behaviors suggests additional research is needed in this area.

Demographic characteristics were associated with both healthier and less healthy behavioral characteristics. Hispanics and Non-Hispanic Blacks were more likely to be at higher risk for increased BMI, less weekly hours of physical activity, and less healthy dietary behaviors. Immigrants were at a lower risk for two characteristics (increased BMI and unhealthy dietary habits) and at higher risk for having less weekly physical activity. Female students were at a higher risk of less weekly physical activity. In this study, income was associated with healthy dietary habits but was unrelated to BMI, weekly physical activity, and unhealthy dietary habits.

This was surprising, given research that has documented the decreased income being associated with poorer health in the literature (Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010).

For this sample, age and immigration status were significant variables. Being older (i.e., over age 25) was associated with increased BMI; however being older was also associated with engaging in more healthy dietary habits and fewer unhealthy dietary habits. Immigrants had a lower average BMI and reported consuming less unhealthy foods than non-immigrants. However, being an immigrant was associated with lower weekly physical activity. In addition, we also noted within group differences for our immigrant sample, with immigrants from Europe and Asia having a lower BMI and engaging in more healthy dietary habits when compared to immigrants from the Caribbean, Africa, and Central and South America. Given that this was a cross-sectional study, future research studies should explore these issues longitudinally to further determine the role of age and immigration status.

## CONCLUSION

Given that type 2 diabetes, cardiovascular diabetes, and other chronic illnesses are linked to BMI, physical inactivity, and unhealthy dietary habits, identifying the factors that contribute to unhealthy behaviors is a priority for those concerned with addressing the health of ethnically diverse, urban college students. The findings from this study lend support to the importance of developing tailored interventions to reflect ethnicity, age, and income differences for the greatest benefit. Researchers, college administrators, and college health professionals should continue to target and tailor interventions for all college students with an emphasis on non-Hispanic Black, Hispanic, and low income students; these students are most at risk for ill health associated with BMI, physical inactivity, and poor dietary habits (particularly Campus B and C in this study). In addition, interventions should be targeted to help immigrant students maintain cultural practices that are protective (Lesser, Gasevic, & Lear, 2014) and tailored to help those immigrants from countries who might be most at risk for developing poor health habits. As the proportion of low income, Black, and Hispanic young adults enrolled in college increases, universities become a promising site for developing health interventions that can contribute to achieving a national health goal of reducing socioeconomic and racial/ethnic inequalities in health. New partnerships between universities and urban municipal health departments can help to open a new front in the campaign to eliminate health inequalities and disparities. In collaboration, researchers, college administrators, and college staff can help reach the American College Health Association's (n.d.) Healthy Campus 2020 goals of eliminating health disparities by improving students' health status and increasing risk prevention efforts.

## REFERENCES

American College Health Association. (2014). American College Health Association-National college health assessment II: Undergraduate Students Reference Group Data Report Spring 2014. Hanover, MD: American College Health Association.

American College Health Association. (n.d.). *Healthy campus 2020*. Retrieved from http://www.acha.org/HealthyCampus/objectives.cfm

Braveman, P. A., Cubbin, C., Egerter, S., Williams, D. R., & Pamuk, E. (2010). Socioeconomic disparities in health in the United States: What the patterns tell us. *American Journal of Public Health*, *100*(S1), S186-S196. doi:10.2105/AJPH.2009.166082

Centers for Disease Control and Prevention. (2009). Differences in prevalence of obesity among Black, White, and Hispanic adults --- United States, 2006—2008. *Morbidity and Mortality Weekly Report, 58*(27), 740-744.

Center for Chronic Disease Prevention and Health Promotion. (2011). Retrieved from http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html

Centers for Disease Control and Prevention. (2014a). Youth risk behavior surveillance—United States, 2013. *Morbidity and Mortality Weekly Report, 63*(4), 1-168.

Centers for Disease Control and Prevention. (2014b). *How much physical activity do adults needs*. Retrieved from http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html

Centers for Disease Control and Prevention. (2014c). *How is BMI calculated*. Retrieved from http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html#Interpreted

Chang, S., Pollack, L. M., & Colditz, G. A. (2013). Life years lost associated with obesity-related diseases for U.S. non-smoking adults. *Plos ONE*, *8*(6), 1-7. doi:10.1371/journal.pone.0066550

Cohen, J. C., Aiken, L. S., & West, S. G. (2004). *Regression analysis for the behavioral sciences.* Newbury Park, CA: Sage.

Desai, M. N., Miller, W. C., Staples, B., & Bravender, T. (2008). Risk factors associated with overweight and obesity in college students. *Journal of American College Health, 57*(1), 109-114.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *JAMA, 303*(3), 235-241.

Freedman, D. S. (2011). Obesity — United States, 1988–2008. *National Center for Chronic Disease Prevention and Health Promotion, CDC Morbidity and Mortality Weekly Report, 60*, 73-77.

Freudenberg, N., Manzo, L., Mongiello, L., Jones, H., & Lamberson, P. (2013). Promoting the health of young adults in urban public universities: A case study from City University of New York. *Journal of American College Health, 61*(7), 422-430.

Gropper, S. S., Simmons, K. P., Connell, L. J., & Ulrich, P. V. (2012). Weight and body composition changes during the first three years of college. *Journal of Obesity*, 1-6. doi:10.1155/2012/634048

Hasson, R. E., Adam, T. C., Pearson, J., Davis, J. N., Spruijt-Metz, D., & Goran, A. I. (2013). Sociocultural and socioeconomic influences on type 2 diabetes risk in overweight/obese African-American and Latino-American children and adolescents. *Journal of Obesity*, *201, 3*1-39. doi:10.1155/2013/512914

Helajärvi, H., Rosenström, T., Pahkala, K., Kähönen, M., Lehtimäki, T., Heinonen, O. J., & ... Raitakari, O. T. (2014). Exploring causality between TV viewing and weight change in young and middle-aged adults. The Cardiovascular Risk in Young Finns Study. *Plos ONE*, *9*(7), 1-11. doi:10.1371/journal.pone.0101860

Kasparek, D. G., Sargent, G., & Morris, R. L. (2008). Selected health behaviors that influence college freshman weight change. *Journal of American College Health, 56*(4), 437-444.

Katz, D. L., O'Connell, M., Njike, V. Y., Yeh, M. C., & Nawaz, H. (2008). Strategies for the prevention and control of obesity in the school setting: Systematic review and meta-analysis. *International Journal of Obesity, 32,* 1780-1789.

Kozak, A. T., Daviglus, M. L., Chan, C., Kiefe, C. I., Jacobs, D. R., & Liu, K. (2011). Relationship of body mass index in young adulthood and health-related quality of life

two decades later: The Coronary Artery Risk Development in Young Adults Study. *International Journal of Obesity*, *35*(1), 134-141. doi:10.1038/ijo.2010.120

Lesser, I. A., Gasevic, D., & Lear, S. A. (2014). The association between acculturation and dietary patterns of South Asian immigrants. *Plos ONE*, *9*(2), 1-6. doi:10.1371/journal.pone.0088495

Liu, L. L., Lawrence, J. M., Davis, C., Liese, A. D., Pettitt, D. J., Pihoker, C., & ... Kahn, H. S. (2010). Prevalence of overweight and obesity in youth with diabetes in USA: The SEARCH for Diabetes in Youth Study. *Pediatric Diabetes*, *11*(1), 4-11. doi:10.1111/j.1399-5448.2009.00519.x

National Center for Education Statistics. (n.d.). Projections of education statistics to 2014. Retrieved from http://nces.ed.gov/programs/projections/projections2014/index.asp

National Center for Education Statistics. (2008). *Enrollment rates of 18- to 24-year-olds in degree-granting institutions, by type of institution and sex and race/ethnicity of student: 1967 through 2007*. Retrieved from http://nces.ed.gov/programs/digest/d08/tables/dt08_204.asp

National Student Clearinghouse Research Center. (2013). Tracking the road to college success: Inaugural national high school benchmarks Report. Retreived from http://www.studentclearinghouse.org/about/media_center/press_releases/files/release_presskit_2013-10-15.pdf

Pampel, F. C., Krueger, P. M., & Denney J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology, 36*, 349-370. doi:10.1146/annurev.soc.012809.102529

Pew Research Center. (2009). *College enrollment hits all-time high, fueled by community college surge: Executive Summary. 2009*. Retrieved from http://www.pewsocialtrends.org/2009/10/29/college-enrollment-hits-all-time-high-fueled-by-community-college-surge/

Ping, Z., Chaudhari, R. S., & Antal, Z. (2010). Gender differences in cardiovascular risks of obese adolescents in the Bronx. *Journal of Clinical Research in Pediatric Endocrinology*, *2*(2), 67-71. doi:10.4274/jcrpe.v2i2.67

Pratt, K. J., Lazorick, S., Lamson, A. L., Ivanescu, A., & Collier, D. N. (2013). Quality of life and BMI changes in youth participating in an integrated pediatric obesity treatment program. *Health & Quality Of Life Outcomes, 11*(1), 1-9. doi:10.1186/1477-7525-11-116

Romero, C. X., Romero, T. E., Shlay, J. C., Ogden, L. G., & Dabelea, D. (2012). Changing trends in the prevalence and disparities of obesity and other cardiovascular disease risk factors in three racial/ethnic groups of USA adults. *Advances in Preventive Medicine*, 1-8. doi:10.1155/2012/172423

Selvin, E., Parrinello, C. M., Sacks, D. B., & Coresh, J. (2014). Trends in prevalence and control of diabetes in the United States, 1988-1994 and 1999-2010. *Annals of Internal Medicine*, *160*(8), 517-526.

St-Onge, M., Perumean-Chaney, S., Desmond, R., Lewis, C. E., Yan, L. L., Person, S. D., & Allison, D. B. (2010). Gender differences in the association between sleep duration and body composition: The Cardia Study. *International Journal of Endocrinology*, 1-8. doi:10.1155/2010/726071

United States Department of Labor. (2010). *TED: The editor's desk*. Retrieved from http://www.bls.gov/opub/ted/2010/ted20100428.htm

US Census Bureau. (2009). *Data from the US Census Bureau's current population survey: School enrollment--social and economic characteristics of students*. Retrieved from http://www.census.gov/hhes/school/

U.S. Census Bureau. (2012). Current Population Reports, PPL-148, P-20 and School enrollment. Retrieved from https://www.census.gov/prod/2011pubs/12statab/educ.pdf

U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2010). *Dietary guidelines for Americans, 2010* (7th ed.). Washington DC: U.S. Government Printing Office. Retrieved from http://www.health.gov/dietaryguidelines/dga2010/dietaryguidelines2010.pdf

U.S. Department of Education, National Center for Education Statistics. (2009). *Digest of Education Statistics, 2008 (NCES 2009-020).* Retrieved from http://nces.ed.gov/fastfacts/display.asp?id=98

U.S. Department of Education, National Center for Education Statistics. (2011). *Community college student outcomes: 1994-2009*. Retrieved from http://nces.ed.gov/pubs2012/2012253.pdf

U.S. Department of Education, National Center for Education Statistics. (2013). *Digest of Education Statistics, 2012* (NCES 2014-015), Chapter 3. Retrieved from http://nces.ed.gov/fastfacts/display.asp?id=98