J Behav Health 2013; 2 (2):127-134 *ISSN: 2146-8346*

GESDAV

Journal of Behavioral Health

available at www.scopemed.org

Original Research

Attitudes and practice of healthy lifestyle in young African American student population.

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Received: August 08, 2012

Accepted: October 11, 2012

Published Online: November 05, 2012

DOI: 10.5455/jbh.20121011011918

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Key words:
Attitudes, lifestyle, Metabolic Syndrome, African American, Students

Abstract

Background: More young adults, especially young African Americans (AA) are at greater risk for Metabolic Syndrome (MetS). Screening to determine its prevalence and evaluation of attitudes and practice of healthy lifestyles in this population is critical. Objective: The objective was to evaluate the attitudes and ascertain life style choices and the risk for MetS among college students comprising mostly AA young adults at a historically black college (HBCU).

Participants: Each fall since 2009, freshmen students 18-24 years of age (n=376) attending Kentucky State University have participated in the study.

Methods: MetS was defined using 2001 National Cholesterol Education Program's Adult Treatment Panel III. Anthropometrics and blood pressure were obtained, while lipid and glucose concentrations were determined.

Results: Overall prevalence of MetS was 12%. More females than males believed in having three nutritious meals a day, maintaining a healthy weight, and reported avoiding use of alcohol and tobacco than males. However, more females than males had higher Body Mass Index (BMI) as well as waist circumference (WC). More males than females reported greater frequency of being physically active and having seven hours of sleep for most days in a week. Less than half the participants reported consuming less than the recommended five servings of fruit and vegetables and two servings of dairy per day. A statistical correlation was found between high WC and lack of minimum exercise and between high blood pressure (BP) and vegetable intake.

Conclusions: Young AA adults have and are at a significantly higher risk for MetS. It is critical in any college setting, especially in HBCUs to re-implement the practice of performing physical examination at the time of admission and to collect and analyze the data from the health history of the students to offer well targeted Health Education Programs around healthy life style choices.

INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC), approximately 35.7% of the United States' adult population 20 years and older is obese, accounting for approximately 78 million individuals. Approximately 16.9% of children and adolescents (2-19 years) are obese, accounting for approximately 12 million individuals. Body Mass Index (BMI) scales are used to define obesity, which is a ratio of weight (in kg)/height^2 (in meters). For an adult, 20 years and older, a BMI> 30 is classified as obese. Ethnic disparities exist in the prevalence of obesity and obesity related chronic diseases. Highest prevalence of obesity is found in non-Hispanic blacks (44.1%), followed by Mexican Americans (39.3%), all Hispanics (37.9%), and Caucasians (32.67%). Geographically most obese states are located in the South or South-east, which have a significant presence of African American (AA) and Hispanic populations. It is well known that obesity increases the risk for chronic diseases such as high blood pressure, Type II diabetes, cardiovascular

diseases (CVD), strokes, certain types of cancers. In addition to the load due to chronic diseases and the associated, yet avoidable morbidity and mortality, the medical cost of obesity is estimated to be approximately $147 billion [1]. CVD is the leading cause of all natural deaths in the United States and is the second leading cause of natural deaths in young adults 18-24 years [2, 3] .In particular, it is the leading cause of all natural deaths in AAs in this age group [4], mirroring the underlying obesity related health issues in this ethnic group.

Per the 2010 census, more than 12 million young adults aged 18-24 years were enrolled in colleges and universities in the United States [5]. About 214,000 or 16% of all AA higher education students in the nation are enrolled at Historically Black Colleges and Universities (HBCUs), which comprise 3% of all colleges and universities nation-wide. Most of the HBCUs have an enrollment of about 3,000 undergraduate students, predominantly AAs [6].The American College Health Association, which includes more than 2,800 members from nearly 1,000 institutions of higher education, designed goals for the Healthy Campus 2010 campaign, based on those promoted in the Healthy People 2010[7, 8] .Some of the goals of the campaign included promoting physical activity, improving food and nutrient intake, and decreasing overweight and obesity rates. However, few colleges, especially HBCUs, have baseline health risk status and food intake information to make any well informed and effective strategies to achieve these goals.

Research documents that first year college students experience weight gain faster than the average adult [9, 10]. Furthermore, students entering college arrive on campus heavier than any prior generation [11, 12].Some of the known contributing factors that play a role are the general food environment, poor diets, consumption of large portions of energy-dense foods, changes in lifestyle, physical inactivity and limited parental control, all contributing to excess weight gain and increased risk for chronic diseases [13, 14, 15, 16, 17]. With the obesity epidemic disproportionately affecting young AA adults, this problem is further compounded by other factors such as poverty, lack of access to health care and, most important of all, limited knowledge of existing health risks [18].

In order to address the above mentioned issues, identifying the need for an integrated initiative with a focus on well targeted research-cum-outreach, the 'Student Health Awareness and Prevention Evaluation: an Undergraduate Program at Kentucky State University' (**SHAPEUP-KSU**) was launched for the freshmen students attending KSU in the fall of 2009. Some of the expected outcomes of the **SHAPEUP-KSU** were to evaluate attitudes regarding healthy behaviors, ascertain lifestyle habits and health status, as well as their risk for Metabolic Syndrome (MetS), so as to design effective prevention and intervention strategies.

The primary objective for this communication was to report the findings regarding attitudes about healthy behaviors and ascertain life style habits and health status pertaining to the risk for Metabolic Syndrome (MetS) among the representative population of Kentucky State University, an HBCU, where the majority of the students are AA. MetS is a cluster of interrelated cardio-metabolic risk factors that include, but are not limited to obesity, insulin resistance, lipid imbalance and hypertension. MetS is usually considered to be a precursor of coronary heart disease (CHD) and diabetes [19, 20] .The International Diabetes Federation (IDF) and the National Cholesterol Education Programs Adult Treatment Panel III (NCEP ATP III) criteria define the essential components of MetS as high waist circumference (WC) (>102 cm for males and > 88cm for females),accompanied by two of the four additional risk factors: elevated fasting glucose (GLU)≥ 100mg/dL, decreased high-density lipoprotein cholesterol (HDL-C) (< 40 mg/dL for males and <50 mg/dL for females), elevated triglycerides (TG) (≥ 150mg/dL), and elevated blood pressure (BP) (≥ 130 mmHg systolic blood pressure(SBP) and ≥ 85mmHg diastolic blood pressure(DBP). Some of the expected outcomes of the **SHAPEUP- KSU** were to help design effective obesity prevention and intervention strategies for this population.

MATERIAL AND METHODS

The design and the proposed protocols for the **SHAPEUP KSU** Program were approved by Kentucky State University's Institutional Review Board (IRB) in 2009. Each fall since 2009, freshmen students were recruited through various on-campus avenues, primarily from Freshmen Orientation Program, and various sections of the University Orientation Class (UNV 101) and health fairs. Students were addressed in their classrooms regarding the features of the **SHAPEUP KSU** Program and invited to participate. Students were informed that the participation is voluntary.

Following were the inclusion criteria:

- The participant must be a freshman student attending Kentucky State University,
- The participant should be between 18-24 years old,
- The participant should be normally healthy.

Following were the exclusion criteria:

- Pregnant or lactating females,
- Those on medication for any diagnosed chronic health condition such as diabetes, hypertension or any other metabolic condition.

Willing students signed a written consent to participate. The participants were informed that the data collected during the evaluations will be used strictly for research purposes, ensuring participant confidentiality. The participants were also informed that they could withdraw at any time during the course of the evaluations without any adverse consequences. Participant identifications were coded and the records were maintained in a designated locked facility. In the three years of the study, 812 freshmen from approximately 1600 students admitted, offered their consent to participate, while 376 participants completed the health screenings, 361 students consisting of 150 males (42%) and 211 females (58%) completed all the required assessments. Approximately 91.4% of these students were AAs and the average age of all participants was 19.8 years.

Attitudes, Practice and Health Risk Awareness Survey

Each participant completed a survey of 37 questions and provided demographic information, including place of residence and the dorm name. Questions explored the students' attitudes and practices regarding healthy lifestyle behaviors. Each behavior assessment question was scored on the basis of how many days a week the participant reported meeting a specific guideline, i.e., exercise or participation in sports at least 30 minutes. To ascertain the student's attitude toward lifestyle choices, students were asked to rate specific behaviors (i.e., being active at least 30 minutes a day) as being "Not at all important to their health and wellness", "Somewhat important" or "Very important". Questions were also posed to explore knowledge of the family history for chronic diseases such as overweight and obesity, diabetes, hypertension, CHD, strokes, low birth weight, high cholesterol/high triglycerides and cancer.

Anthropometrics

All measurements were performed by a Registered Nurse in a private setting and obtained using standard procedures; following a 10 hour minimum fast, wearing light clothing without shoes and/or socks and after voiding. Each measurement was conducted in duplicate unless variance between the measurements exceeded the standards. The average of two readings was recorded. Height was recorded to the nearest 0.1 cm using a Seca Rod 220 stadiometer (Seca, Hamburg, Germany). Weight was recorded using a calibrated TANITA, (TANITA, Arlington Heights, Il.) scale to the nearest 0.1kg. BMI was calculated using the formula: weight in kilograms/height in meters2 (kg/m2). BMI classifications used were underweight (<18.5kg/m2), normal (18.5-24.9kg/m2), overweight (25-29.9kg/m2), and obese (≥30.0kg/m2). Subject's waist circumference (WC) was measured at the top of the iliac crest upon exhalation to the nearest 0.1cm using Gulick fiberglass, non-stretchable tape measure with a tensometer (Patterson Medical, Mount Joy, PA).

Biochemical and Clinical Assessments

After a 10 hour minimum fast, students reported to the pre-assigned clinical setting in their respective dorms for a pre-scheduled 15 minute screening appointment. On arrival, the participant was seated and offered a health risk survey/questionnaire. After a five minute resting phase, systolic and diastolic blood pressure was recorded using an automated monitor (HEM 757, Omron Health Care Inc, Bannockburn, IL). Blood pressure was recorded in duplicate, within one minute's interval between measurements. If variance between the two measurements exceeded the standard of 2 mmHg, the measurement was repeated. A blood sample was collected via finger-stick with the participant in a seated position. Total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), triglyceride (TG), and blood glucose (GLU) were assessed by a desktop portable analyzer (Cholestech LDX, Hayward, CA). Using a combination of enzymatic methodology and solid phase technology, the analyzer measures a complete lipid and glucose profile in blood within five minutes. The HDL-C is calculated by the analyzer using the Friedwald formula [21]. If the values of any of the tested parameters were found abnormal, another sample was drawn from the same participant within a week's time. The participants were a give a copy of their results and strongly encouraged to follow up with their health care provider if values were found outside the normal range.

Statistical Analysis

SPSS software version 19.0 (SPSS, Chicago, IL) was used for analysis. Significance of gender differences in the frequency of reported behaviors and attitudes was based on the Chi square value determined by the Crosstabs procedure.

RESULTS

The majority of the participating subjects were AAs (91.2%), followed by Caucasians (5.6%), with a mean age 19.88 years. Approximately 58% were females (n=218) and 42% were males (n=158). More than 85% of the participants resided in the college dormitories that were not equipped with in-room kitchen facilities, while the remaining resided in private housing. Despite

approximately 46% of the participants being in the normal BMI range of ≤ 24.9 (n=174), the Mean BMI was in the overweight range (26.94±6.89 kg/m^2), accounting for approximately 26.3%, (n=99), with 25% (n=94) being obese (BMI ≥30). Table 1 shows the gender differences in the anthropometric, clinical and biochemical parameters in the study population.

Point prevalence of MetS in the total sample was 12 %. A total of 31.4% of the sample had at least one criterion for MetS and 20.7% of the sample had at least two criteria for MetS .As shown in Figure 1 more females than males had no MetS criteria.

Table 1. Gender differences in the anthropometric, clinical and biochemical parameters in the study population.

	All participants (N=361)		Females (N=211)		Males (N=150)		Sig. (p-value)
	Mean	SD	Mean	SD	Mean	SD	
Age (years)	19.8	3.2	19.7	2.9	19.9	3.6	0.534
SBP (mmHg)	120.4	14.0	115.4	11.7	127.3	14.1	0.000
DBP (mmHg)	74.1	10.3	73.6	9.7	74.8	11.1	0.271
WC (cm)	81.4	15.6	81.5	16.2	81.3	14.6	0.920
BMI (kg/m2)	27.0	6.9	27.8	7.5	25.8	5.8	0.007
TC (mg/dL)	154.0	30.6	155.3	31.4	152.2	29.4	0.337
HDL-C (mg/dL)	50.1	14.5	53.1	14.3	45.9	13.7	0.000
TG (mg/dL)	86.6	47.6	80.7	44.7	95.0	50.2	0.005
GLU (mg/dL)	93.2	12.4	91.7	11.3	95.4	13.6	0.006

SD= Standard Deviation; SBP= systolic blood pressure; DBP=diastolic blood pressure; WC=waist circumference; BMI=body mass index; TC=total cholesterol; HDL-C= high density lipoprotein cholesterol; TG=triglycerides; GLU= glucose. Data analyzed using ANOVA tests to determine gender differences.

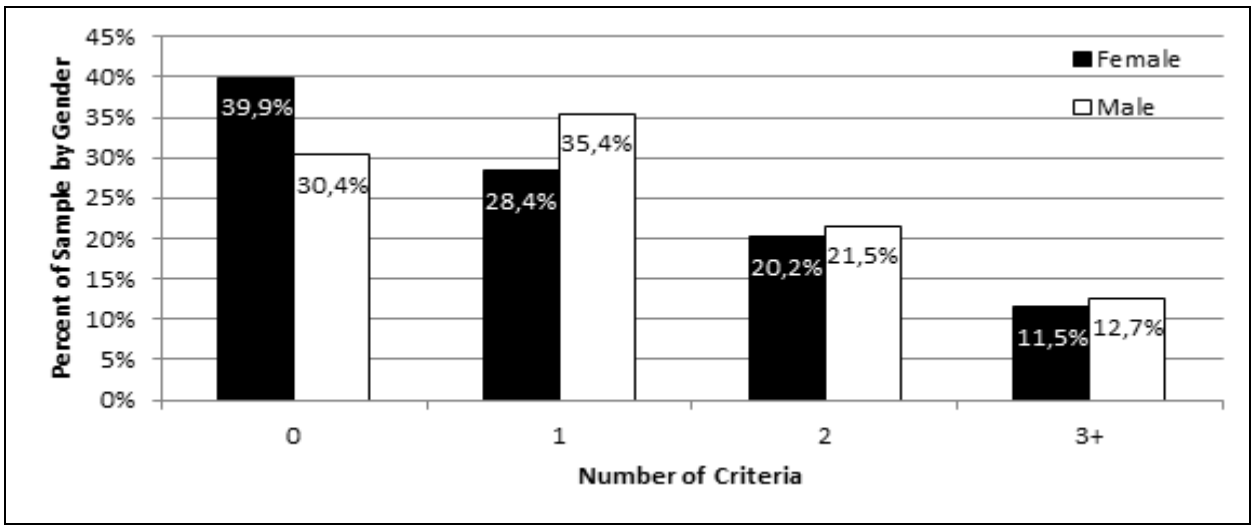

Figure 1: Number of MetS factors by gender**.** Data analyzed using Crosstabs Procedure, Pearson Chi-Square test for significance, non-Parametric Independent t-test. Female n=218; Male n=158.

Table 2 depicts the prevalence of attitudes toward healthy behaviors between the genders. Overall, more females (74%) than males (61%) reported believing that it is important to have three nutritious meals a day, while both genders reported almost equally in believing it is important to have at least 30 minutes of physical activity most days of the week. However, there was a significant difference (p=0.004) in the attitudes toward avoiding use of alcohol and tobacco products between the genders, with more females avoiding than males. Similarly, significant difference was observed (p=0.003) between the genders in the attitudes toward maintaining healthy weight.

Table 3 shows the reported frequency of practice of healthy and unhealthy behaviors. A statistically significant difference (p=000) was observed between the genders in the reported level of physical activity of at least 30 minutes per day for most days of the week, with more males than females reporting to be that active. Further, not even half of the participants reported consuming the recommended two servings of fruits a day, with only approximately one-third of the participants reporting consuming less than the recommended three servings of vegetables per day. Only about half of the participants reported having at least two servings of dairy per day. Furthermore, more males reported having at least seven hours of sleep per day, for most days of the week than females. A significantly higher number of females reported skipping at least a meal most days of the week (p=002), while a significantly higher number of males reported using tobacco products (p=000). Although not significant, more females than males reported eating a snack before bed.

Table 4 shows the incidence of MetS criteria among participants who did and did not adhere to the daily guidelines at least four days in a week. Although a significantly higher rate for the risk for MetS was found in this student population (12%), no statistically significant correlation was observed in the individual criteria for MetS such as risk for lower HDL, TG or GLU with those who reported healthy and unhealthy behaviors. However, among the individual criteria for MetS, about 24.3% participants who reported consuming less than the recommended servings of vegetables per day for most days in a week showed a significantly higher risk for elevated BP. Also, a statistical significance was observed for risk of higher WC in those who reported having less than 30 minutes of physical activity per day, for four or more days in a week and in those who reported having less than seven hours of sleep per day, for four or more days in a week

Table 2. Prevalence of attitudes toward healthy behaviors

	Very important to your health	Somewhat important to your health	Not at all important to your health	Sig. (p-value)
Eating three nutritious meals				
Females	74%	26%	--	.019
Males	61%	38%	1%	
Being active at least 30 minutes				
Females	78%	22%	1%	.380
Males	75%	23%	2%	
Sleeping at least 7 hours				
Females	70%	29%	1%	.054
Males	71%	24%	5%	
Avoiding the use of alcohol and tobacco				
Females	79%	16%	5%	
Males	63%	28%	9%	.004
Maintaining a healthy weight				
Females	89%	10%	1%	.003
Males	75%	21%	4%	

Table 3. Frequency of practice of various healthy and unhealthy behaviors

Days per week		4+ days	1-3 days	0	Sig. (p-value)
Exercise at least 30 minutes	Females	35%	46%	19%	0.000
	Males	57%	34%	9%	
Consume at least 2 fruit servings	Females	41%	50%	9%	0.412
	Males	37%	57%	6%	
Consume at least 3 vegetable servings	Females	34%	56%	10%	0.834
	Males	36%	53%	11%	
Consume at least 2 dairy servings	Females	55%	37%	8%	0.966
	Males	53%	38%	9%	
Sleep at least 7 hours	Females	53%	40%	7%	0.002
	Males	71%	25%	3%	
At least 2 hours TV/video games	Females	42%	45%	13%	0.857
	Males	41%	47%	12%	
Skip any meal	Females	85%	11%	4%	0.000
	Males	67%	25%	9%	
Eat a snack before bed	Females	55%	39%	6%	0.020
	Male	47%	39%	14%	
Use any tobacco products	Females	4%	7%	90%	0.000
	Males	18%	10%	72%	
Consume a serving of alcohol	Females	2%	18%	80%	0.381
	Males	3%	23%	74%	

Crosstabs procedure, Pearson Chi Square statistic

Table 4. Incidence of MetS criteria detected among participants who did/did not adhere to daily guidelines at least 4 days a week[1]

	MetS criterion found					
	High BP > 135/85			Waist Circumference Females >= 88cm Males >=102cm		
	4+ days per week	< 4 days per week	Sig. (p-value)	4+ days per week	< 4 days per week	Sig. (p-value)
30 minutes of exercise	21.4%	20.3%	.450	15.7%	25.2%	.018
2 fruit servings	16.8%	23.4%	.083	23.8%	19.3%	.185
3 vegetable servings	14.3%	24.3%	.017	23.8%	19.6%	.210
2 dairy servings	19.0%	22.9%	.216	22.6%	19.3%	.264
7 hours of sleep	21.5%	19.7%	.397	16.4%	28.2%	.006

Chi-Square, Fisher's Exact Test

[1] There were no significant differences found between those who complied with the guidelines and those who did not for the remaining MetS criteria.

DISCUSSION

During the evaluation of the attitudes, frequency of healthy and unhealthy behaviors as well as the clinical evaluation for risk for MetS, it was found that more females than males reported that it was very important to have three nutritional meals a day and it was important to maintain a healthy weight. However, more females skipped at least one meal per day, for four or more days in a week than males. Also, more females than males reported having a snack before bed for more than four days in a week. This unhealthy behavior among the female participants involved in the study may be partly mirrored by the fact that more females than males had a significantly higher BMI. One of the objectives of Healthy People 2010 is to increase the proportion of people who consume six or more servings of fruits and vegetables daily [22]. Between 1990 and 2000 the proportion of Americans who consumed five servings a day has increased. However, the values since have remained constant [23]. Although the net calorie intake has substantially increased, no net increase in calories from fruits and vegetables have been observed [24]. One of the objectives of the Healthy Campus 2010 is to increase the proportion of college students who have received information on dietary behaviors and nutrition from the current baseline of 32.7% to a target of 55% and to reduce the proportion of adolescents and college students who are overweight and obese from the current baseline of 29.5% to 16% [7, 8]. In the current study, despite approximately 46% of the participants being in the normal BMI range (n=174), the mean BMI was in the overweight range (26.94±6.89 kg/m^2), accounting for approximately 26.3%, (n=99), with 25% (n=94) being obese. Similarly, one of the objectives of the Healthy People 2010 is to increase the proportion of college students who have received information on physical activity and fitness from the baseline of 33.5%, to a target of 55% and to increase the proportion of college students who engage in physical activity at least three days/week at moderate intensity for at least 30 minutes, or vigorous physical activity for 20 minutes or more minutes with the baseline of 40.3%, to a target of 55%. In the current study an alarmingly lower number of females (approximately 35%) reported to be physically active for most days of the week. Although assumed to be healthy, the current study reveals a significantly high and latent presence of MetS in this predominantly young AA population, which also has an alarmingly lower level of physical activity. Furthermore, the survey also reveals a disproportionately higher occurrence of high BP associated with lower vegetable intake among the participants and certain unhealthy practices among female participants regarding their diet and nutritional status. Similarly, the observed unhealthy attitude and practices toward the use of alcohol and tobacco among males demand immediate remedial measures.

CONCLUSION

Although most of the data on the attitudes and frequency of practice of certain health behaviors is self-reported, the higher prevalence of MetS, poor attitudes toward diet, and nutritional and physical activity among this student population warrant a systematic diet recall, nutritional assessment, and nutritional education. Greater emphasis on behavior modifications toward more appropriate life style choices is critical in this population. Also, encouraging participation and more accurate tracking of physical activity will facilitate accurate information on the overall change in attitudes and practices among the student participants.

The findings of this study indicate and emphasize that college health professionals in general and those from HBCUs in particular have the challenge of designing and offering health- related communication and education programs on a variety of topics, especially addressing prevention of obesity and its related risk to chronic diseases. It is critical to re-implement the practice of performing physical examinations at the time of admission, to collect and analyze the data from the health history of the students, and to offer well targeted Health Education Programs around proper life style choices with an emphasis on diets rich in fruits and vegetables, and in having the recommended physical activity levels.

ACKNOWLEDGEMENTS

This work was funded by the United States Department of Agriculture Evans-Allen-KY State Matching Grant KYX-50-09-23H. The authors thank the study participants, undergraduate research assistants and Mrs. Susan Templeton for help in data management and statistical analyses.

This article's AES Contribution No. KYSU-000012.

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