ETHNIC AND GENDER DIFFERENCES IN LIFESTYLE RISK FACTORS IN A BI-ETHNIC PRIMARY CARE SAMPLE: PREVALENCE AND CLINICAL IMPLICATIONS

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Objective: To demonstrate how simple screening methods can be used to define modifiable lifestyle risk factors in primary care settings and educate clinicians regarding ethnic and gender differences in risk factor profiles.

Design: Observational study

Participants: 3286 patients (1613 African Americans, 1673 non-Hispanic Whites)

Intervention: Lifestyle risk factor assessment using nine-question health habits questionnaire and vital signs measurement

Main Outcome Measures: Rates of tobacco use, risky drinking, obesity, and inactivity

Results: 29.8% of patients reported tobacco use, 68.9% exercised less than three times per week, 41.1% were obese, and 9.5% screened positive for risky drinking. Whites reported more tobacco use (34.5% vs 24.9%) and risky drinking (10.3% vs 8.8%), while African Americans were more likely to be obese (46.1% vs 36.3%) and inactive (73.2% vs 64.7%). Risky drinking declined in all groups except African American males after age 65.

Conclusions: Simple questionnaires and vital signs measurements are useful in screening for modifiable lifestyle risk factors in primary care clinics. Results can be used to identify risk factor patterns in different ethnic, age, and gender groups and to prioritize prevention interventions for individual patients. Simplified methods of assessing overweight and obesity are needed. (*Ethn Dis*. 2006;16:460–467)

Key Words: Risk Factors, Population Groups, Mass Screening, Lifestyle, Primary Health Care

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INTRODUCTION

The leading causes of preventable death in the United States are tobacco abuse, unhealthy diet, inactivity, and alcohol abuse, accounting for 38% of preventable deaths.[1,2] Tobacco abuse is the leading cause of preventable death in the United States, resulting in ≈440,000 premature deaths and $157 billion in health-related economic losses annually.[3] Obesity and inactivity are risk factors for most cardiovascular diseases, some cancers, and degenerative joint disease. Poor diet and physical inactivity lead to 300,000 deaths each year, second only to tobacco use.[4] Medical costs associated with physical inactivity in the United States for 2000 were $76.6 billion. The annual cost of obesity is an estimated $117 billion. Data from the 1999–2000 National Health and Nutrition Examination Survey (NHANES) indicate that 64% of US adults are overweight (33%) or obese (31%).[5] Results from the Behavioral Risk Factor Surveillance System (BRFSS) 2001 indicate that most US adults are not physically active at a level to promote health, with 50.9% Whites and 63.7% African Americans failing to achieve the recommended level of exercise.[6] Modest, regular physical activity substantially reduces the risk of dying of coronary heart disease and reduces the risk for colon cancer, diabetes, and hypertension.[7] Physical activity also helps to control weight; contributes to healthy bones, muscles, and joints; helps to relieve the pain of arthritis; and reduces symptoms of anxiety and depression.[8] Obesity is associated with many diseases, including hypertension, type 2 diabetes, and metabolic syndrome.[9–12] In addition, nearly one third of US adults engage in risky drinking patterns, increasing their risk of alcohol-related trauma and development of alcohol abuse or alcoholism.[13] Annual alcohol-related deaths are estimated at 100,000, with a total annual economic cost of $148 billon.[14] Because most alcohol-related problems occur in at-risk nondependent drinkers, increasing attention is being given to developing screening programs that detect and address risky drinking, rather than focusing primarily on diagnosis and management of alcohol dependence.[15–17]

Although US primary care clinics treat large numbers of patients with diseases associated with modifiable lifestyle risk factors, many clinics do not routinely screen for and address lifestyle risk factors. Existing studies provide general US population data on risk factor prevalence[7]; however variations in prevalence at the regional level may be significant and may have implications for individual primary care practices.[18] Previous studies indicate that the population of the southern United States is at particularly high risk for cardiovascular disease.[19–22] The highest rates of sedentary lifestyle in the United States have been found in rural areas and the southern United States.[23] Efforts are underway to create efficient risk factor screening tools for primary care.[24,25] Several brief alcohol intervention studies have generated time-efficient clinical tools that gather information about alcohol use while also surveying other health habits such as cigarette smoking, exercise, and weight control.[26–29] As part of the Healthy Habits Project, a primary care project designed to increase screening and intervention for modifiable risk factors, we used a simple, nine-item questionnaire, along with measurements of height and weight, to

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assess lifestyle risk factors among adults in a sample with large numbers of both African American and non-Hispanic White patients. The purpose of this paper is to describe how simple screening measures provided clinical information regarding the prevalence of tobacco abuse, obesity, inactivity, and hazardous drinking in this bi-ethnic, southern outpatient sample.

METHODS

This study, approved by the institutional review board of the Medical Center of Central Georgia in Macon, Georgia, was conducted from June 2002 to July 2003. Administrative staff and clinicians at a residency-based family medicine clinic were recruited to participate in a project that included comprehensive health habits screening and implemented specific protocols for intervening with hazardous and harmful drinkers.[30] The clinic offers primary care to ≈1,300 adult outpatients each month, with roughly equal proportions of African American and White patients. Trained medical receptionists were requested to ask all adult patients to read a patient informed consent statement and then complete a nine-item health habits questionnaire (HHQ) before seeing their clinician.

Survey Instrument and Administration Procedures

The HHQ was modeled after the Health Appraisal Survey used in the University of Connecticut's Cutting Back program.[29] The original questionnaire gathered information about alcohol use while also collecting information regarding weight, tobacco use, and exercise. We incorporated questions from the Health Appraisal Survey that assess how many days per week patients exercise for at least 20 minutes; how many cigarettes they smoke; for former smokers, how long ago they quit; and the three questions about alcohol consumption from the AUDIT-C, a validated instrument for detecting hazardous and harmful drinking[31–33] (see Table 1). Questions regarding patient age, gender, and ethnicity were also included. As part of nursing vital signs, nurses measured patient weight by using a floor scale and, on some patients, nurses measured height by using a standing stadiometer. During the first six months of the study, patients were asked to voluntarily complete the health questionnaire at each office visit. Patient completion rates during this portion of the study were 40%. After six months, the questionnaire was incorporated into a comprehensive mandatory annual clinical information update administered by medical receptionists to all patients. Because of increasing use of smokeless tobacco in the area, the question on smoking was changed to: "Do you use any kind of tobacco?" During this portion of the study, completion rates were 82%. Retrospectively, body mass index (BMI) was calculated by using measured weights and either measured height or self-reported height, gathered from copies of patient driver's licenses included in their medical records.

DEFINITIONS

Lifestyle risk factors were defined according to current, nationally accepted guidelines. Inactivity was defined as exercising for at least 20 minutes fewer than three times per week.[4,7,8] Overweight was defined as BMI 25–29.99 kg/m^2.[34] Obesity was defined as BMI ≥30 kg/m^2, and morbid obesity as a BMI ≥40 kg/m^2.[34] Tobacco use was defined as a positive response to the following questions: "On a typical day, how many cigarettes do you smoke?" (during the initial eight months) or "Do you use any kind of tobacco?" (during the last five months of the study). Hazardous or harmful drinking, or "risky drinking," includes patients with alcohol use disorders (alcohol abuse or alcohol dependence) as well as patients who exceed "safe drinking" guidelines established by the National Institute for Alcohol Abuse and Alcoholism (NIAAA): >14 drinks per week or >4 drinks per occasion for men and >7 drinks per week or >3 drinks per occasion for women.[13] In this study, risky drinking was identified by using the AUDIT-C, a three-question instrument that assesses usual quantity and frequency of drinking and frequency of binge drinking.[31–33] A modified scoring system created by the University of Connecticut's Cutting Back Program was used to identify patients exceeding NIAAA "safe drinking" guidelines.[17,29] The cutoff points for the instrument were ≥7 points for all women and for men over age 65 and ≥8 points for men under age 65.

Statistical Analysis

Statistical programs available in SPSS for Windows, version 13.0, were used for this analysis.[35] Race- and gender-specific differences in continuous variables, including age, weight, and BMI, were assessed by using Student *t* tests. Gender- and race-specific frequencies of categorical variables, including overweight, obesity, exercise, smoking, hazardous drinking, and tobacco use, were determined by using chi-squared tests. The customary *P* values of <.05 were used to indicate statistical signifi-

Table 1. Health habits questionnaire

1 On average, how many days per week do you exercise for at least 30 minutes?
0 ☐ None. I do not exercise. *3* ☐ 5–6 days
1 ☐ 1–2 days *4* ☐ Daily
2 ☐ 3–4 days

2 In the best interest of your overall health, how many pounds do you believe you need to lose?
0 ☐ 0–10 lbs. 3 ☐ 31–40 lbs.
1 ☐ 11–20 lbs. 4 ☐ 41–50 lbs.
2 ☐ 21–30 lbs. 5 ☐ Over 50 lbs.

3 On average, how many days per week do you eat foods that are high in cholesterol or saturated fat?
0 ☐ None. *3* ☐ 5–6 days
1 ☐ 1–2 days *4* ☐ Daily
2 ☐ 3–4 days

4 On a typical day, how many cigarettes do you smoke?
0 ☐ None. I do not smoke. *4* ☐ 16–20
1 ☐ 1–5 5 ☐ 21–30
2 ☐ 6–10 6 ☐ Over 30
3 ☐ 11–15

5 If you don't smoke now but used to, how long has it been since you quit?
0 ☐ Not applicable 3 ☐ 7–11 months
1 ☐ 3 months or less *4* ☐ 1–4 years
2 ☐ 4–6 months *5* ☐ 5 or more years

6 How often do you drink anything containing alcohol? (***If you do not drink, check "Never" and skip to question 9.***)
0 ☐ Never *3* ☐ Weekly
1 ☐ Less than monthly *4* ☐ 2–3 times a week
2 ☐ Monthly *5* ☐ 4–6 times a week
6 ☐ Daily

In the following questions, a drink means one beer, one glass of wine, one wine cooler, or a mixed drink of hard liquor. Each counts as one drink; a mixed drink with double shots counts as two drinks.

7 How many drinks do you have on a typical day when you are drinking?
0 ☐ 1 drink *3* ☐ 4 drinks
1 ☐ 2 drinks *4* ☐ 5–6 drinks
2 ☐ 3 drinks *5* ☐ 7–9 drinks
6 ☐ 10 or more

8 How often do you have four or more drinks on one occasion?
0 ☐ Never *3* ☐ Weekly
1 ☐ Less than monthly *4* ☐ 2–3 times a week
2 ☐ Monthly *5* ☐ 4–6 times a week
6 ☐ Daily

9 Has your healthcare provider discussed any of the following health habits with you in the past 12 months?

Health Habit	Yes	No
Exercise	☐	☐
Diet	☐	☐
Smoking	☐	☐
Alcohol Use	☐	☐

cance. Prevalence of physical activity, obesity, hazardous drinking, and tobacco use were age-adjusted by using the direct method. Because BMI was calculated by two different methods, statistical analysis was performed to determine whether significant differences existed between the two measurement methods. For the 327 subjects who had both measured and self-reported height, BMI was calculated by both methods, and no differences were found with Student *t* test. A statistically significant high correlation ($R>.80$) was also seen between measured and self-reported heights from subject's driver's licenses. Hence, a single dataset for BMI was created that included all subjects with measured height and 1925 additional subjects with self-reported heights.

RESULTS

A total of 3286 subjects (1164 men and 2122 women) completed questionnaires. The basic characteristics of the sample are displayed in Table 2. The female part of the sample was 64.6%, with a mean age of 42.0 (SD 16.9). African Americans represented 49.1% of those surveyed, and 50.9% were non-Hispanic Whites. Because White patients were older than their African American counterparts ($P<.001$), prevalence rates for each individual lifestyle risk factor were age-adjusted. The prevalence of each lifestyle risk factor by both ethnicity and gender is displayed in Table 3.

Inactivity

Among all patients, 68.9% exercised fewer than three times per week. Prevalence of inactivity by ethnicity and gender is displayed in Table 3. African Americans reported more inactivity than non-Hispanic Whites (73.2% vs 64.7%, $P<.05$), and women reported significantly more inactivity than men (73.4% vs 60.7%, $P<.05$). African American males were the least likely to report no exercise at all (29.8%), while non-Hispanic White males were the most likely to report exercising three or more times per week (41.0%). Overall, the ≥65 age category had the highest prevalence of physical activity, followed by the 50–64 age cohort.

Obesity

The percentage of patients overweight or obese was 70.0%, with 31.6% classified as obese and 9.5% morbidly obese. Prevalence of obesity by ethnicity and gender is displayed in Figure 1. Although no statistically significant racial differences among men were seen with respect to weight and BMI, African American women were heavier than White women, as measured by both weight and BMI ≥30 kg/m^2 ($P<.001$). Morbid obesity

Table 2. Descriptive characteristics of study population

	African American	Non-Hispanic White	*P* value
Sample size	1613	1623	
Age (years)	39.5 ± 14.9	45.0 ± 17.0	<.001
Weight (lb)	190.2 ± 50.3	186.5 ± 49.5	<.001
BMI (kg/m^2)	30.8 ± 7.9	28.0 ± 5.0	<.001
Prevalence (%)			
Inactivity	73.2	64.7	<.001
Obesity	46.1	36.3	<.05
Hazardous drinking	8.8	10.3	<.001
Tobacco use	24.9	34.5	<.05

(BMI ≥40 kg/m^2) was significantly more common among African American females (16.2%), when compared to all other groups (3.8% to 8%).

Tobacco Use

Over the entire year, 29.8% of patients reported tobacco use. Whites reported significantly more tobacco use than African Americans (34.5% vs 24.9%, $P<.05$), and men reported more tobacco use than women (36.7% vs 25.9%, $P<.05$). Table 4 shows variations in the prevalence of tobacco use according to age. Non-Hispanic White males had the highest prevalence of tobacco usage among the early age cohorts (18–34 and 35–49), and African American males had the highest prevalence of tobacco use among the later age cohorts (50–64 and ≥65). After age 65, African American males continued to use tobacco at a high rate (35.3%), while use dropped dramatically among all other groups. Cigarette smokers represented 92.9% of all tobacco users and 27.6% of all patients surveyed. The percentage of cigarette smokers exceeds both Georgia's statewide prevalence rate (23.3%) and the 2002 nationwide prevalence (23.1%).[36] White cigarette smokers smoked significantly more cigarettes per day than African American smokers ($P<.05$), and most African American smokers reported smoking ≤10 cigarettes per day. Heavy smoking (≥21 cigarettes per day) was most prevalent among non-Hispanic White males ($P<.05$). Additional data collected during the final five months of the study indicated that smaller percentages of patients used other tobacco products: 1.9% snuff, 1.1% cigars, .2% pipe, and .9% other. Snuff use was highest among White males ages 18–34 (10.6%) and African American females ages ≥65 (10.8%). Cigar use was highest among African American males ages 18–34 (4.7%), while other tobacco use, probably representing chewing tobacco, was highest in White males ages ≥65 (6.1%).

Risky Drinking

Over the 13-month period surveyed, 9.5% of all patients screened positive for risky drinking. Risky drinking was more common among men than among women (15.7% vs 6.1%, $P<.05$), and Whites reported more hazardous drinking than African Americans (10.3% vs 8.8%, $P<.001$). The prevalence of risky drinking by age, gender, and ethnicity is displayed in Table 4. Among all groups except African American men, risky drinking rates remained similar from ages 18 to 64 and then dropped significantly. Risky drinking patterns among African American men, however, showed a bimodal distribution, with peaks at age 35–49 and again after age 65.

DISCUSSION

While previous studies have examined risk factor profiles such as tobacco, alcohol, and drug use in a primary care population,[28,37,38] to our knowledge, this study is the first to report the primary care prevalence of risk factors related to the three leading causes of death in the United States: tobacco use, diet and exercise, and alcohol use.[2] Primary care patients interviewed in this study had a higher prevalence of tobacco use (29.8% vs 23.1%), obesity (41.1% vs 31%), and sedentarism (68.9% vs 47.5%) than the general US population.[4,36,39] This overrepresentation of unhealthy lifestyles in primary care emphasizes that primary care clinics are an ideal setting for addressing these risk factors. In addition, we confirm the high prevalence of these cardiovascular risk factors in the South, which has previously been noted to have a significantly higher rate of cardiovascular mortality.

Table 3. Lifestyle risk factors by gender and ethnicity

	Male			Female		
	African American	Non-Hispanic White	*P* value	African American	Non-Hispanic White	*P* value
Prevalence (%)						
Obesity	35.5	38.3	<.001	50.5	34.8	<.001
Inactivity	63.5	59.0	<.001	77.0	69.0	<.001
Hazardous drinking	15.0	16.2	<.072	6.3	5.9	<.05
Tobacco use	32.8	38.4	<.05	21.1	30.8	<.001

Table 4. Frequency distribution of exercise per week, tobacco use by age, number of cigarettes smoked, and hazardous drinking by ethnicity, gender, and age

	Male		Female	
	African-American	Non-Hispanic White	African American	Non-Hispanic White
	% of Subjects	% of Subjects	% of Subjects	% of Subjects
Number of days of exercise per week*				
Sample size	446	687	1127	941
None	29.8	31.6	40.3	37.6
1–2	33.6	27.4	36.7	31.3
3 or more	36.5	41.0	23.0	31.0
Tobacco use by age*				
Sample size	451	693	1129	951
Age cohorts				
18–34	26.3	42.1	16.6	33.7
35–49	35.5	43.8	28.3	35.8
50–64	40.4	36.6	25.9	34.1
≥65	35.3	19.4	12.2	14.7
Number of cigarettes smoked*				
Sample size	204	337	558	487
1–10	27.0	8.6	12.7	12.1
11–20	7.4	18.1	5.7	13.1
≥21	1.5	10.4	.4	6.2
Hazardous drinking†				
Sample size	380	598	963	809
Age cohorts				
18–34	13.4	18.8	6.6	6.3
35–49	21.2	16.1	6.4	5.9
50–64	7.2	17.0	7.4	8.1
≥65	18.8	6.7	1.5	2.7

* $P<.001$ (chi-square test of distribution) when comparing African Americans and non-Hispanic Whites for both males and females.

† For males, $P<.05$; for females, $P=.073$.

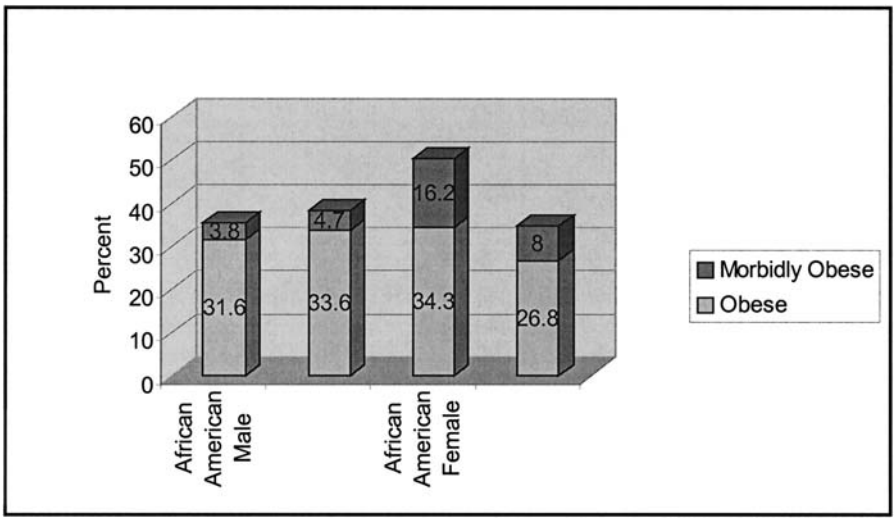

Fig 1. Prevalence of obesity by ethnicity and gender

. . . this study is the first to report the primary care prevalence of risk factors related to the three leading causes of death in the United States: tobacco use, diet and exercise, and alcohol use.

The study also confirms previous data documenting differences in risk factor profiles between non-Hispanic Whites and African Americans. Recent research regarding ethnic disparities in disease patterns has highlighted that, for many conditions, minority patients bear greater risks for disease and have less access to preventive services.[40] In this study's outpatient population, African Americans were more likely to be obese (46.1% vs 36.3%) and inactive (73.2% vs 64.7%), consistent with previous studies.[18] Figure 1 highlights the striking prevalence of obesity among African American women, which needs to be addressed by primary care providers. Because a high percentage of sedentary adults are open to lifestyle and exercise interventions by their physicians,[41] and simple office interventions can increase levels of physical exercise,[42] clinicians should be aggressive in addressing these risk factors.

Findings regarding ethnic differences in alcohol use are also of interest. This study found less risky drinking among African Americans than Whites. While previous US nationwide surveys have failed to reveal significant differences in problem drinking between African Americans and Whites,[43–45] one previous regional study found significant ethnic differences between African Americans and Whites. The Piedmont Health Survey found that in urban areas of central North Carolina, Whites were more likely to be problem drinkers, while in the surrounding rural areas, African Americans had dramati-

cally higher rates of problem drinking.[46] These finding and ours highlight the need for better epidemiologic studies of problem drinking in the South, with its large rural population, ethnic diversity, and high number of abstainers. Our study noted higher levels of hazardous drinking among non-Hispanic Whites ages 18–34, increases in African American risky drinking ages 34–49, and markedly increased hazardous drinking among African American males after age 65, in contrast to declines in all other groups. Increased problem drinking rates among White young adults and African American elders was also noted in analyses of the epidemiologic catchment area studies.[45] Other researchers have also noted increases in problem drinking among African Americans in middle age[47] and that rates of heavy drinking have not declined as much among African American men as among White men over the past two decades.[48,49] Persistent heavy drinking, especially at older ages, could be a contributing factor to the higher death rate from alcohol-related causes in African Americans when compared with Whites.[47,50] Because brief interventions by primary care providers decrease alcohol consumption in adult patients, including the elderly,[51,52] identifying and addressing problem drinking in middle-aged and elderly African Americans could decrease this burden of disease.

This study also found that African American patients were less likely to use tobacco (24.8% vs 34.5%, $P<.001$) or smoke cigarettes (22.8% vs 32.2%), with the greatest differences in cigarette smoking seen in patients <50 years. Among cigarette smokers, African Americans smokers smoked significantly fewer cigarettes. These findings are consistent with those of previous studies that noted that African American cigarette smokers begin smoking later and smoke fewer cigarettes per day.[53–55] Nonetheless, the significance of these differences must be weighed in light of data from the Third National Health and Nutrition Examination Survey indicating that African American smokers demonstrate higher cotinine levels than Whites at all levels of cigarette smoking.[56] Our study found high rates of snuff use in both African Americans and Whites, confirming findings of other studies that found high levels of smokeless tobacco use, especially snuff, in young White males and elderly African American females in the South.[57,58] The variety of tobacco products used, coupled with evidence that African American smokers find it harder to quit,[56] indicate that clinicians should view tobacco use as a serious health issue among both African Americans and Whites and should use intensive tobacco cessation efforts for all users.

Analysis of risk factor patterns by age yielded the finding that all four risk factors were less common in patients age ≥65. While our methods do not allow calculation of the number of ill elderly patients who were unable to complete the screening questionnaire, findings suggest healthier lifestyle habits among patients who survive to age 65 and beyond. Further research is needed to determine whether elderly patients, who often have more leisure time, may be more health-conscious and more open to risk factor interventions.

Limitations

These findings from a southern outpatient clinic may not be representative of practices in other parts of the United States; nonetheless, the ethnic disparities noted in our population parallel those previously published elsewhere. The superior health habits of the elderly patients in this sample may be skewed if some ill elderly patients were unable to complete the written questionnaire; however, one other national study has also found increases in physical exercise among patients over age 65.[59]

Future Studies

While this study represents a step in the direction of routine health habits screening, many improvements are needed. Simpler, quicker methods for assessing obesity and overweight need to be developed and pilot tested. Simplified methods of calculating BMI could facilitate routine inclusion of BMI in the nursing vital signs. Methods for including electronic calculations of BMI and alcohol screening scores as part of electronic medical records could make individual risk factor profiles available to clinicians during their office visits. Simple measures of screening for high cholesterol consumption and low consumption of fruits and vegetables need to be developed. Finally, efficient intervention methods for addressing lifestyle risk factors in the context of routine primary care need to be developed and tested.

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