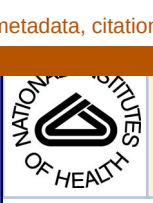

Published in final edited form as:

Clin Cardiol. 2012 January ; 35(1): 43–48. doi:10.1002/clc.20992.

Relationship between Cardiovascular Disease Knowledge and Race/Ethnicity, Education and Weight Status

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Abstract

Background—Inadequate CVD knowledge has been cited to account for the imperfect decline in CVD among women over 2 decades.

Hypothesis—Due to concerns that at-risk women might not know the leading cause of death or symptoms of a heart attack, our goal was to assess the relationship between CVD knowledge race/ethnicity, education and BMI.

Methods—Using a structured questionnaire, CVD knowledge, socio-demographics, risk factors, and body mass index(BMI) were evaluated in 681 women.

Results—Participants included Hispanic, 42.1 %(n=287); non-Hispanic white(NHW) 40.2% (n=274); non-Hispanic black(NHB) 7.3% (n=50) and Asian/Pacific Islander(A/PI) 8.7% (n=59). Average BMI was 26.3±6.1 kg/m^2. Hypertension was more frequent among overweight (45%) and obese (62%) than normal weight (24%), p<0.0001; elevated total cholesterol was more frequent among overweight (41%), and obese (44%) than normal weight (30%) (p<0.05 and p<0.01 respectively); and diabetes was more frequent among obese (25%) than normal weight (5%) (p<0.0001). Knowledge of the leading cause of death and symptoms of a heart attack varied by race/ethnicity and education (p<0.001), but not BMI. Concerning the leading cause of death among US women: 87.6% (240/274) NHW answered correctly compared to 64% (32/50) NHB (p<0.05); 28.3% (80/283) Hispanics (p<0.0001) and 55.9% (33/59) A/PI (p<0.001). Among participants with ≤ 12 years of education, 21.2% knew the leading cause of death and 49.3% heart attack symptoms vs. 75.7% and 75.5%, respectively for > 12 years (both p <0 .0001).

Conclusions—Effective prevention strategies for at-risk populations need to escalate CVD knowledge and awareness among the under-educated and minority women.

Keywords

cardiovascular disease knowledge; race/ethnicity; weight

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The funding source had no role in the manuscript design, data collection, data analysis or text.

INTRODUCTION

A daunting phenomenon in the US is the increase in average weight, a health concern affecting nearly 2 of every 3 US women, and a global problem associated with diabetes, hypertension, and hyperlipidemia (1), (2). The health hazards of obesity have been recognized for centuries and in 1998 the American Heart Association (AHA) identified obesity as a major modifiable CVD risk factor (3). Yet, substantial numbers fail to recognize an abnormal weight is a cause for concern (4),(5). Despite reports that an ever-increasing weight is negatively associated with survival, and increases CVD risk, fewer than 50% are aware of healthy levels of risk factors or can name the major risk factors (6). Among participants treated for lipid disorders, 27% did not know their risk and notably, women were less likely to be aware of risk (7). Inadequate health education is a public health concern as CVD risks linked to obesity such as diabetes, hypertension, and hyperlipidemia are on the rise (8, 9). Failure to recognize an abnormal weight makes it less likely that calls for weight control are seen as personally relevant and, might be ignored by the overweight and obese who neither perceive their weight as abnormal nor recognize associated risks.

Knowledge of CVD risk has been linked to preventive actions to maintain good health and empower individuals to adapt healthier lifestyles (10, 11). The percentage of women recognizing that heart disease is the leading cause of death increased from 30% to 46% between 1997 and 2006 (12). By 2009, it improved again such that 54% answered correctly, however, was not superior to the immediate preceding report (57%) (13). Limited CVD knowledge has been reported among those with cardio-metabolic disorders who are at greater risk for CVD events (14). Due to concerns that other at-risk women might not know vital CVD facts, a primary aim was to assess CVD knowledge among overweight and obese participants who might be uninformed of the escalating CVD burden associated with excess weight. (15). Accordingly, we tested whether the overweight or obese have less CVD knowledge and are less likely to correctly perceive body size than normal weight participants.

METHODS AND MATERIALS

Heart Health in Action is a longitudinal observational program whose participants include a convenience sample of 798 individuals attending the outpatient clinical services of Columbia University Medical Center, Northern Manhattan. Data from the baseline interview of 681 adult women without exclusion criteria were analyzed. Exclusion criteria were based on high-risk Framingham Risk Score > 20%(16) including known coronary artery disease, CVD procedure (angioplasty, bypass surgery, stent placement, etc.), myocardial infarction, ischemic cardiac syndrome, stroke, transient ischemic attack, pregnancy, and age ≤ 18 years. The Institutional Review Board approved the study and participants enrolled from July, 2007 to February, 2010 provided written informed consent. The project is designed to evaluate CVD knowledge and awareness, socio-demographics, CVD risk, and lifestyle (diet, physical activity, attitudes) among women (17), (18).

Measures

All completed a 5-page standardized face-to-face questionnaire in English or Spanish adapted from the validated Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System (19) that included self-report medical history, socio-demographics, sources of nutrition counseling and diet information. Weight, height, waist circumference and blood pressure were measured. Body mass index (BMI) [weight (kg)/ height (m^2)] was calculated and classified as underweight (< 18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25–29.9 kg/m^2), and obese (> 30 kg/m^2).

Race/Ethnicity

Race and ethnicity were defined by self-identification modeled after the U.S. census (20) and defined by 6 categories: 'Hispanic/Latino, NHW, Native American, NHB, A/PI and Other.' Data from groups other than NHW, NHB, Hispanic, and A/PI were collected but excluded from analysis involving race/ethnicity because of small sample size.

Education

Years of education was categorized as: Never attended school or attended < 8 years (elementary); attended 9–12 years (high school); attended > 12 years including college, vocational, or technical school (college).

Residence, Insurance

Suburban or urban residency was determined. Health insurance status was categorized as Medicaid or state, Medicare, commercial or a health maintenance organization, private pay, none, or other.

Stunkard Silhouetes

The 9-figure, sex-specific Stunkard rating scale was used as an adjunct to BMI to evaluate individual awareness of self-size (21). Participants chose silhouettes from underweight; normal weight; overweight; and obese identified as: 1) current body image or self-size, 2) ideal and healthy body image (22). Current body image is the figure selected in response to: "Which figure do you look like?" The "ideal" or healthy body image is the figure chosen in response to: "Which figure do you think is "ideal"? Selected silhouettes were compared to the calculated BMI. National guidelines and normative data link the Stunkard figures with BMI and the scale has validity and test-retest reliability (23, 24).

Assessing Knowledge

Participants were questioned about knowledge of CVD, initiated by the AHA and Healthy People 2010 to improve cardiovascular health and quality of life (Chapter 12, Heart Disease and Stroke, 12.2 & 12.8) (15, 25). Three questions, each with a single correct answer, were asked: 1) what is the leading cause of death among US women; 2) what are early warning symptoms of heart attack and; 3) what are the actions to take if experiencing a heart attack? (15). Choices for the leading cause of death included: a) breast cancer, b) lung cancer, c) HIV/AIDS, d) heart disease, e) stroke. The correct answer is: d) heart disease. Selections for symptoms of a heart attack included: a) shortness of breath, b) dizziness, c) chest pain or

discomfort, d) significant fatigue, e) all of the above. The correct answer is: e) all of the above. Selections for actions to take if experiencing a heart attack included: a) call 911, b) drive yourself to the hospital, c) ask a friend to drive you to the hospital, d) make an appointment with the doctor. The correct answer is: a) call 911.

Statistical Analysis

Analyses were carried out with SAS for Windows 9.2 (SAS Institute, Cary, NC). The results are reported as means and standard deviations for continuous variables (age, education, BMI) and as frequencies and percentages for categorical variables (race/ethnicity, residence, health insurance, CVD knowledge, risk factors, waist size). Differences between participants were assessed using t-tests for continuous variables and Fisher's exact test for categorical variables. Analyses related to body size were performed for the entire cohort and stratified by BMI category. Multivariable logistic regression analysis was used to test for differences between racial-ethnic groups with respect to: 1) knowledge of the leading cause of death among women, 2) the warning symptoms of a heart attack, and 3) actions to take if experiencing a heart attack, with age, education, and BMI category included as covariates. The significance of the relationship between CVD knowledge and weight categories utilized the calculated BMI based on measured weight and height. A p-value < 0.05 was considered significant for all analyses.

RESULTS

Demographics

Of the 798 participants, 681 had no exclusions including Hispanic women, 42.1% (n=287); NHW 40.2% (n=274); NHB 7.3% (n=50) and A/PI 8.7% (n=59) (Table 1). The mean age was 49±16 yrs and Hispanics (46±15 yrs), ($p<0.001$) and A/PI (46±16 yrs) ($p<0.01$) were younger than NHW (52±17 yrs) (Table 1). Mean education was 14.2±4.3 yrs, however, more NHW participants (94.9%) and A/PI (84.5%) ($p<0.01$) than NHB (66.0%) ($p<0.0001$) or Hispanics (37.6%), ($p<0.0001$) attended college. The majority, 80.8 % (n= 550), resided in urban areas. Most had private, state or federal insurance (670/681, 98.4%) including managed care, private pay or other commercial (50.2%); Medicaid (36.4%); Medicare (10.9%); and other (2.5%).

Risk Factors

One or more self- reported risk factors included: hypertension (249/651, 38.3%); hypercholesterolemia (233/650, 35.9%); smoking (92/678, 13.6%); diabetes mellitus (66/649, 10.2%) and overweight/obesity (326/681, 47.9%)(Table 1). Compared to normal weight participants (24%), hypertension (≥140/90 mm Hg) (26) was more frequent among overweight (45%) and obese (62%), ($p<0.0001$). Similarly, elevated total cholesterol (>200 mg/dL) (27) was more frequent among overweight (41%), and obese (44%) than normal weight participants (30%) ($p<0.05$ and $p<0.01$ respectively); and diabetes mellitus (fasting plasma glucose ≥100/mg/DL) (28) was more frequent among obese (25%) ($p<0.0001$) than normal weight (5%) (Fig. 1).

CVD Knowledge and Race-ethnicity

Responses concerning the leading cause of death among US women varied by race/ethnicity: 87.6% (240/274) NHW answered correctly compared to 64% (32/50) NHB ($p<0.05$); 28.3% (80/283) Hispanics, ($p<0.0001$) and 55.9% (33/59) A/PI ($p<0.001$) (Fig. 2). Responses concerning the early warning symptoms of a heart attack varied by race/ethnicity: 80.7% (221/274) NHW answered correctly compared to 68% (34/50) NHB ($p<0.001$); 56.7% (161/284) Hispanics, ($p<0.001$) and 49.2% (29/59) A/PI ($p<0.001$). The majority (89.1%) knew to call 911 if experiencing symptoms of a heart attack; however, fewer A/PI, 74.6% (44/59), responded correctly ($p<0.05$).

CVD Knowledge and Education

Among participants with ≤ 12 years of education, 21.2% identified the leading cause of death and 49.3% knew the symptoms of a heart attack vs. 75.7% and 75.5%, respectively for those with > 12 years of education (both $p < .0001$) (Fig. 3). Knowledge of the need to call 911 did not relate to years of education (≤ 12 yrs: 90.7%; > 12 yrs: 88.1%). Among participants with >12 years of education, there was no significant difference in knowledge of the leading cause of death (normal weight: 75.2%; overweight: 76.9%; obese: 76.4%) or knowledge of the symptoms of a heart attack (normal weight: 73.6%; overweight: 75.9%; obese: 80.6%).

CVD Knowledge and BMI

The leading cause of death among US women was answered correctly by 53.2% of overweight and 47.5% of obese vs. 65.9% of normal weight women ($p < 0.001$ and $p <0 .01$, respectively). Overall 66.7% answered correctly concerning warning symptoms of a heart attack, however, overweight (59.6%) and obese participants (65.7%) were less likely to answer correctly than normal weight women (71.1%), but the difference was significant for overweight women only ($p < 0.01$). The need to call 911 did not vary by weight classification. While in the univariate analyses CVD knowledge differed by race/ethnicity, education, and BMI, when all factors are analyzed simultaneously there is no significant difference among BMI classifications.

BMI and Race/Ethnicity

The average BMI was 26.3±6.1 kg/m^2. Compared to NHW women, 24.8±5.1 kg/m^2, the BMI was higher among Hispanic, 28.0±6.2 kg/m^2 and NHB women, 30.3±7.6 kg/m^2 ($p<0.0001$), and lower among A/PI, 22.1±3.6 kg/m^2 ($p<0.01$) (Table 1). Compared to NHW (36.9%), Hispanic (61.3%) and NHB participants (76.0%) were more likely to have BMI ≥ 25 ($p<0.0001$) while A/PI (18.6%) were less likely to have BMI ≥ 25 ($p<0.001$). A similar pattern was observed for waist size ≥ 35 inches: NHW (30.0%), NHB (59.2%), Hispanics (55.7%) (Both $p<0.0001$), and A/PI (13.8%) ($p<0.05$)(Table 1).

BMI and Size Awareness

Overall, 62.6% selected a silhouette appropriate for their BMI; 28.4% chose a silhouette underestimating BMI and 9.0% chose a silhouette overestimating BMI. Obese women were less likely to select an appropriate body silhouette (41.1%) than normal weight women

(69.7%) (p< 0.001). Underestimation of body size was greatest among overweight (31.9%) and obese (58.9%) compared to normal weight women (14.4%)(both p< 0.001). Obese women were more likely than normal weight women to choose overweight or obese silhouettes as “ideal” (20.6% vs. 0.3%, p < .0001).

Counseling

Nutritional advice from physicians was acknowledged by 54% (351/650), and did not vary by weight classification. More overweight (77.6%) and obese participants were concerned about weight compared to normal weight (51.2%) (p<0.01 and p<0.001 respectively), and a greater percentage of overweight (76.0%) and obese (90.0%) than normal weight women (48.5%) were trying to lose weight (both p<0.001). Hispanics reported less counseling: 48% (137/287) compared to 58% (158/274) NHW, 64% (32/50) NHB, and 62% (24/39) A/PI (p<0.02).

DISCUSSION

Knowledge

Attention has focused on inadequate awareness and knowledge of CVD to account for the imperfect decline in CVD among women over two decades (13, 29). Knowledge of the leading cause of death and warning symptoms of a heart attack are critical for activating emergency systems and receiving time-dependent therapies to reduce morbidity and improve survival (13, 29). While recognition of CVD as the leading cause of death among women has almost doubled since 1997 (13), it continues to lag particularly amongst racial-ethnic minorities and those with ≤ high school education (18) (30). Here, fewer Hispanic and NHB women, and those with ≤12 years of education identified the leading cause of death and symptoms of a heart attack. An unexpected finding was that A/PI women had the lowest recognition of symptoms of a heart attack and were less likely to know to call 911; however, the sample size was small and definitive conclusions cannot be drawn. CVD is now the leading cause of death in Chinese women and rates of awareness are low (31).

While in the univariate analyses, knowledge differed by race/ethnicity, education, as well as BMI, when all factors are analyzed simultaneously there is no significant difference among BMI classifications. Rather, the differences are due to race/ethnicity and education. Among college educated women responding to the questions, there were no differences among BMI categories, and from this we conclude that educational efforts regarding heart disease should be directed at less educated minority women.

Awareness

Figural stimuli were utilized as an adjunct to the BMI to understand awareness of personal size (21). Underestimation of size was greatest among overweight and obese women, and the obese were less likely to select appropriate silhouettes. Failure to recognize an above-standard size makes it less likely that weight control is seen as personally relevant or those likely to benefit from weight control recognize the consequences with respect to long-term effects including diminished weight gain (32), weight maintenance (33), or risk control. A troubling finding was that a substantial minority of obese women felt an overweight

silhouette was “ideal” suggesting current normal standards are shifting to larger sizes (34) and raising concerns that obese women might be unaware of the escalating CVD morbidity and mortality associated with excess weight (4),(5) or that behavioral changes such as diet and increased activity diminish risk (18). We did not ask about excess weight and escalating CVD morbidity and mortality which might give insight into attitudes about weight and risk.

Although substantial numbers were concerned about weight or trying to lose weight, physicians provided nutritional information in slightly more than half. In contrast, 70% who smoke acknowledge receiving medical guidance and counseling about tobacco use (35). The missed opportunity to discuss a key preventive health measure eliminates an important step (36), since counseling is effective and those who receive guidance are more likely to attempt weight loss, increase physical activity, or both (37, 38).

Limitations

The Heart Health in Action questionnaire is self-reported and subject to recall, is gender-specific, and participants are primarily urbanites. Self-report responses can be biased due to forgetfulness or exaggeration, social desirability, or affected by feelings at the time of the interview. Whether results would be similar among men and participants from broader geographic areas is unclear. The Stunkard figure rating scale is widely used among racial/ethnic groups, but may not detect subtle differences in perception. Some participants do not use the full range of the scale, those with the highest BMI may not choose larger figures, and NHB women may perceive themselves as thinner than similarly sized NHW with equivalent BMI (39),(40). Since physicians and patients may differ in recollections, it is possible patients received more nutritional guidance than reported (36).

Conclusions

Improving CVD knowledge and enhancing awareness are worthy targets in efforts to decrease CVD morbidity and mortality. Vigilance in targeting minority women with low levels of education provides opportunities to broaden the scope for risk reduction and advance the goal of diminished adverse CVD outcomes.

Acknowledgments

This work was funded by Department of Health and Human Services (1HHCWH050003-01-00), and the Arlene and Joseph Taub Foundation, Paterson NJ and supported by Grant UL1 RR024156, National Center for Research Resources (NCRR), National Institutes of Health (NIH) and NIH Roadmap for Medical Research. The contents are the responsibility of the authors and do not necessarily represent the view of NCRR or NIH.

Abbreviations

CVD	cardiovascular disease
BMI	body mass index
NHW-	non-Hispanic white
NHB	non-Hispanic black
A/PI	Asian/Pacific Islanders

AHA American Heart Association

References

1. Ogden CL, Carroll MD, Curtin LR, et al. Prevalence of overweight and obesity in the United States, 1999–2004. JAMA. 2006; 295(13):1549–1555. [PubMed: 16595758]
2. Wilson PW, D'Agostino RB, Sullivan L, et al. Overweight and obesity as determinants of cardiovascular risk: the Framingham experience. Arch Intern Med. 2002; 162(16):1867–1872. [PubMed: 12196085]
3. Eckel RH, Krauss RM. American Heart Association call to action: obesity as a major risk factor for coronary heart disease. AHA Nutrition Committee Circulation. 1998; 97(21):2099–2100.
4. Falba TA, Busch SH. Survival expectations of the obese: Is excess mortality reflected in perceptions? Obes Res. 2005; 13(4):754–761. [PubMed: 15897485]
5. Manson JE, Willett WC, Stampfer MJ, et al. Body weight and mortality among women. N Engl J Med. 1995; 333(11):677–685. [PubMed: 7637744]
6. Mosca L, Mochari H, Christian A, et al. National study of women's awareness, preventive action, and barriers to cardiovascular health. Circulation. 2006; 113(4):525–534. [PubMed: 16449732]
7. Lewis SJ, Fox KM, Bullano MF, et al. Knowledge of heart disease risk among SHIELD respondents with dyslipidemia. Circ Cardiovasc Qual Outcomes. 2009; 2(3):207–212. [PubMed: 20031839]
8. Roger VL, Go AS, Lloyd-Jones DM, et al. Heart Disease and Stroke Statistics–2011 Update: A Report From the American Heart Association. Circulation. 123(4):e18–e209. [PubMed: 21160056]
9. Oken B, Hartz A, Giefer E, et al. Relation between socioeconomic status and obesity changes in 9046 women. Prev Med. 1977; 6(3):447–453. [PubMed: 905235]
10. Goff DC Jr, Mitchell P, Finnegan J, et al. Knowledge of heart attack symptoms in 20 US communities. Results from the Rapid Early Action for Coronary Treatment Community Trial. Prev Med. 2004; 38(1):85–93. [PubMed: 14672645]
11. McGruder HF, Greenlund KJ, Malarcher AM, et al. Recognizing signs of heart attack and taking action. Ethn Dis. 2008; 18(2):236–237. [PubMed: 18509934]
12. Mosca L, Ferris A, Fabunmi R, et al. Tracking women's awareness of heart disease: an American Heart Association national study. Circulation. 2004; 109(5):573–579. [PubMed: 14761901]
13. Mosca L, Mochari-Greenberger H, Dolor RJ, et al. Twelve-year follow-up of American women's awareness of cardiovascular disease risk and barriers to heart health. Circ Cardiovasc Qual Outcomes. 2010; 3(2):120–127. [PubMed: 20147489]
14. Giardina EG, Sciacca RR, Foody JM, et al. The DHHS Office on Women's Health Initiative to Improve Women's Heart Health: focus on knowledge and awareness among women with cardiometabolic risk factors. J Womens Health (Larchmt). 20(6):893–900. [PubMed: 21492002]
15. Veazie MA, Galloway JM, Matson-Koffman D, et al. Taking the initiative: implementing the American Heart Association Guide for Improving Cardiovascular Health at the Community Level: Healthy People 2010 Heart Disease and Stroke Partnership Community Guideline Implementation and Best Practices Workgroup. Circulation. 2005; 112(16):2538–2554. [PubMed: 16230505]
16. Grundy SM, Balady GJ, Criqui MH, et al. Primary prevention of coronary heart disease: guidance from Framingham: a statement for healthcare professionals from the AHA Task Force on Risk Reduction. American Heart Association. Circulation. 1998; 97(18):1876–1887. [PubMed: 9603549]
17. Giardina EG, Laudano M, Hurstak E, et al. Physical activity participation among Caribbean Hispanic women living in New York: relation to education, income, and age. J Womens Health (Larchmt). 2009; 18(2):187–193. [PubMed: 19183090]
18. Cassetta JA, Boden-Albala B, Sciacca RR, et al. Association of education and race/ethnicity with physical activity in insured urban women. J Womens Health (Larchmt). 2007; 16(6):902–908. [PubMed: 17678461]

19. U.S. Department of Health and Human Services. , editor. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Questionnaire. Atlanta: 2004.
20. Office of Management and Budget. Race and ethnic standards for federal statistics and administrative reporting. (Directive no, 15). Federal Registar. 1978; 43(87):19269.
21. Stunkard AJ, Sorensen T, Schulsinger F. Use of the Danish Adoption Register for the study of obesity and thinness. Res Publ Assoc Res Nerv Ment Dis. 1983; 60:115–120. [PubMed: 6823524]
22. Lynch E, Liu K, Spring B, et al. Association of ethnicity and socioeconomic status with judgments of body size: the Coronary Artery Risk Development in Young Adults (CARDIA) Study. Am J Epidemiol. 2007; 165(9):1055–1062. [PubMed: 17327218]
23. Bulik CM, Wade TD, Heath AC, et al. Relating body mass index to figural stimuli: population-based normative data for Caucasians. Int J Obes Relat Metab Disord. 2001; 25(10):1517–1524. [PubMed: 11673775]
24. Stunkard, AJST.; Schulsinger, F., editors. Use of the Danish Adoption Register for the study of obesity and thinness. New York: Raven Press; 1983.
25. Keppel KG, Pearcy JN. Healthy People 2000: an assessment based on the Health Status Indicators for the United States and each state. Healthy People 2000 Stat Notes. 2000; (19):1–31. [PubMed: 11475488]
26. Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA. 2003; 289(19):2560–2572. [PubMed: 12748199]
27. Grundy SM, Cleeman JI, Merz CN, et al. Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III guidelines. Circulation. 2004; 110(2): 227–239. [PubMed: 15249516]
28. Standards of medical care in diabetes–2011. Diabetes Care. 34(Suppl 1):S11–61. [PubMed: 21193625]
29. Vaccarino V, Parsons L, Peterson ED, et al. Sex differences in mortality after acute myocardial infarction: changes from 1994 to 2006. Arch Intern Med. 2009; 169(19):1767–1774. [PubMed: 19858434]
30. McGruder HE, Greenlund KJ, Malarcher AM, et al. Racial and ethnic disparities associated with knowledge of symptoms of heart attack and use of 911: National Health Interview Survey, 2001. Ethn Dis. 2008; 18(2):192–197. [PubMed: 18507273]
31. Cao Y, DiGiacomo M, Du HY, et al. Cardiovascular disease in Chinese women: an emerging high-risk population and implications for nursing practice. J Cardiovasc Nurs. 2008; 23(5):386–394. quiz 395–386. [PubMed: 18728510]
32. Lynch E, Liu K, Wei GS, et al. The relation between body size perception and change in body mass index over 13 years: the Coronary Artery Risk Development in Young Adults (CARDIA) study. Am J Epidemiol. 2009; 169(7):857–866. [PubMed: 19221119]
33. Molenaar EA, van Ameijden EJ, Vergouwe Y, et al. Effect of nutritional counselling and nutritional plus exercise counselling in overweight adults: a randomized trial in multidisciplinary primary care practice. Fam Pract. 2010; 27(2):143–150. [PubMed: 20026554]
34. Burke MA, Heiland FW, Nadler CM. From “overweight” to “about right”: evidence of a generational shift in body weight norms. Obesity (Silver Spring). 18(6):1226–1234. [PubMed: 19875997]
35. Denny CH, Serdula MK, Holtzman D, et al. Physician advice about smoking and drinking: are U.S. adults being informed? Am J Prev Med. 2003; 24(1):71–74. [PubMed: 12554026]
36. Thande NK, Hurstak EE, Sciacca RE, et al. Management of obesity: a challenge for medical training and practice. Obesity (Silver Spring). 2009; 17(1):107–113. [PubMed: 19107125]
37. Sciamanna CN, Tate DF, Lang W, et al. Who reports receiving advice to lose weight? Results from a multistate survey. Arch Intern Med. 2000; 160(15):2334–2339. [PubMed: 10927731]
38. Galuska DA, Will JC, Serdula MK, et al. Are health care professionals advising obese patients to lose weight? JAMA. 1999; 282(16):1576–1578. [PubMed: 10546698]
39. Parnell K, Sargent R, Thompson SH, et al. Black and white adolescent females’ perceptions of ideal body size. J Sch Health. 1996; 66(3):112–118. [PubMed: 8857160]

40. Kronenfeld LW, Reba-Harrelson L, Von Holle A, et al. Ethnic and racial differences in body size perception and satisfaction. Body Image. 2010; 7(2):131–136. [PubMed: 20096656]

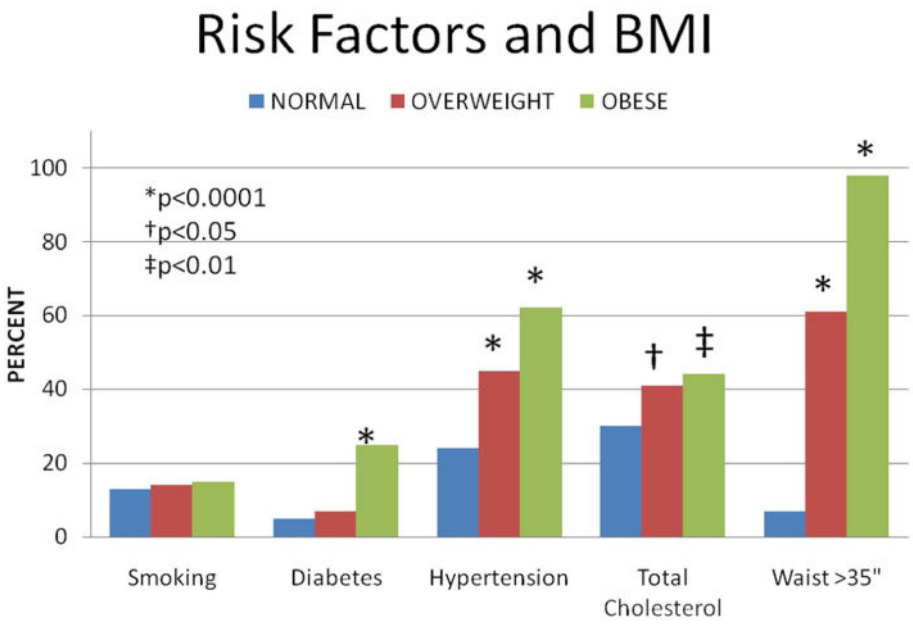

Figure 1.
Risk factors and BMI classification: *p<0.0001, †p<0.05, ‡p<0.01

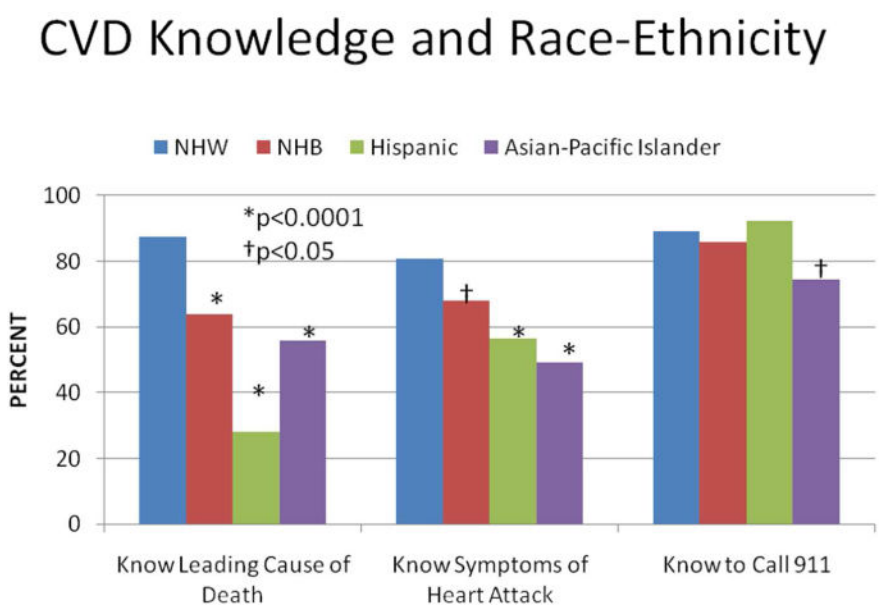

Figure 2.

Compared to Non-Hispanic White women (NHW), knowledge of the leading cause of death and knowledge of heart attack symptoms differed by race-ethnicity. Asian Pacific Islanders were less likely to know to call 911 in case of an emergency, *p<0.0001, †p<0.05

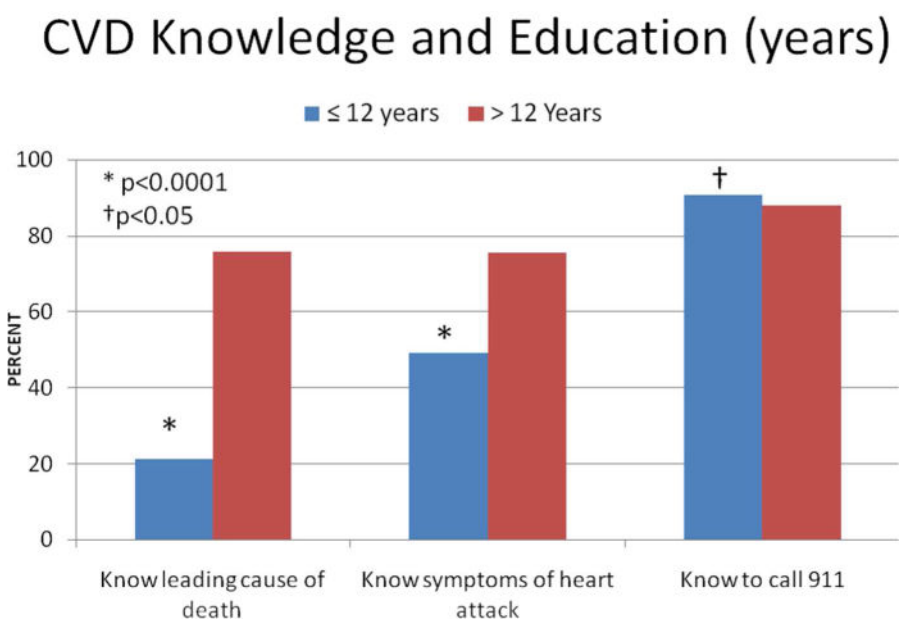

Figure 3.

Compared to those with >12 years of education, knowledge of the leading cause of death among women and heart attack symptoms differed compared to those with ≤12 years. Knowing to call 911 differed between those with <8 years of education and those with >12 years, * p<0.0001, †p<0.05

Table 1

Baseline Characteristics of Participants (n = 681)

Characteristic	N (%) or Mean ± SD	p-value
Race-Ethnicity		
NHW, n (%)	274 (40.2)	
NHB, n (%)	50 (7.3)	
Hispanic, n (%)	287 (42.1)	
Asian/Pacific Islander, n (%)	59 (8.7)	
Other, n (%)	11 (1.6)	
Age (years)		
NHW	52 ± 17	*Reference*
NHB	49 ± 15	.2839
Hispanic	46 ± 15	<0.001
Asian/Pacific Islander	46 ± 16	<0.01
Education (years)[†]		
NHW	16.9 ± 2.1	*Reference*
NHB	14.6 ± 2.8	<0.0001
Hispanic	11.1 ± 4.2	<0.0001
Asian/ Pacific Islander	16.2 ± 4.1	.1563
College (> 12 years)[†]		
NHW, n (%)	258 (94.9)	*Reference*
Non-Hispanic Black, n (%)	31 (66.0)	<0.0001
Hispanic, n (%)	106 (37.6)	<0.0001
Asian/Pacific Islander, n (%)	49 (84.5)	<0.01
Body Mass Index (kg/m^2)		
NHW (271)	24.8 ± 5.1	*Reference*
Under-weight or Normal	170 (62.7)	*Reference*
Over-weight or Obese (BMI≥25kg/m^2)	101 (37.3)	*Reference*
NHB (50)	30.3 ± 7.6	<0.0001
Under-weight or Normal	12 (24)	–
Over-weight or Obese (BMI≥25kg/m^2)	38 (76)	<0.0001
Hispanic (278)	28.0 ± 6.2	<0.0001
Under-weight or Normal	102 (37)	–
Over-weight or Obese (BMI≥25kg/m^2)	176 (63)	<0.0001
Asian/Pacific Islander (59)	22.1 ± 3.6	<0.001
Under-weight or Normal	48 (81.4)	<0.001
Over-weight or Obese (BMI≥25kg/m^2)	11 (18.6)	–
Waist Size ≥ 35 inches (measured		
NHW (270)	81 (30.0)	*Reference*

Characteristic	N (%) or Mean ± SD	p-value
NHB (49)	29 (59.2)	<0.0001
Hispanic (280)	156 (55.7)	<0.0001
Asian Pacific Islander (59)	8 (13.8)	<0.05

Abbreviations: NHW =Non-Hispanic White; NHB = Non-Hispanic Black

Data are presented as number (n); percent (%), mean ± SD

Definition Criteria: Hypertension (≥140/90 mm Hg); Elevated total cholesterol (>200 mg.dL); Diabetes mellitus (fasting plasma glucose ≥100 mg/dL)

Non-Hispanic White Reference for *P* value –

*Age unavailable in 2 Hispanic subjects;

†Education unavailable in 2 NHW, 3 NHB, 5 Hispanic, and 1 Asian/Pacific Islander