

RURAL AFRICAN AMERICANS' DIETARY KNOWLEDGE, PERCEPTIONS, AND BEHAVIOR IN RELATION TO CARDIOVASCULAR DISEASE

Objectives: To determine the relationship of demographics to opinions and knowledge of cardiovascular disease, hypertension, obesity, and dietary intake and to evaluate the relationship of dietary knowledge and dietary behaviors in rural African American adults.

Methods: The cross-sectional study involved a sample of participants who attended one of three cardiovascular information seminars in rural Macon County, Alabama. A total of 127 African American men and women, aged 21–75 years, completed a self-administered 79-item questionnaire. Data analysis included Chi-square and Fisher's exact tests.

Outcome Measures: Agreement or disagreement with current scientific opinion regarding coronary heart disease, obesity, and dietary intake; agreement with statements of personal knowledge of heart disease, hypertension, and dietary intake; assessment and beliefs about the health risks associated with overweight/obesity; and congruence between dietary knowledge and dietary practices.

Results: Women and older respondents tended to agree more with current scientific knowledge about heart disease mortality than did men and younger respondents. Younger respondents reported knowledge but less personal concern about fat intake/heart disease and salt intake/hypertension associations than did other age groups. Participants generally believed that excess weight increased the risk of high blood pressure, diabetes, heart disease, and cancer "a lot." Knowledge of the salt content of processed foods was associated with decreased frequency of adding salt at the table, while those not concerned about salt consumption and hypertension were more likely to add salt and consume processed meats. Respondents with knowledge of the effects of fat intake on heart disease were more likely to consume low-fat dairy products.

Conclusions: The findings suggest that sex and age, in particular, require consideration in the development of community cardiovascular disease intervention programs aimed at southern, rural African American adults. (*Ethn Dis.* 2008;18:6–12)

Key Words: African American, Dietary Knowledge, Perceptions, Beliefs, Behavior, Cardiovascular Disease

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INTRODUCTION

CVD is a major health problem especially in the African American community in the rural Black Belt counties of Alabama. In Macon and Bullock Counties (contiguous Black Belt counties), for example, the death rate from CVD in 2005 was 561 per 100,000 and 461 per 100,000, respectively. These rates exceeded the state and national averages.¹ CVD prevalence in Macon and Bullock Counties is compounded by a high prevalence of many other CVD risk factors, such as high blood pressure and overweight/obesity. These statistics show the need for educational interventions in these communities.

Generally, low socioeconomic status, coupled with rural residency, contributes to greater disparities in nutritional adequacy and overall health. Often, knowledge of heart healthy diets, perception of the quality of one's diet, and actual dietary behavior and quality do not always agree. Assessing one's nutritional knowledge, food selection, and eating behavior are tools used to develop nutrition intervention programs. The gap is often wide between one's perceptions, opinions, and knowl-

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The gap is often wide between one's perceptions, opinions, and knowledge about CVD (and other chronic diseases) and actual dietary practices.^{2–6}

edge about CVD (and other chronic diseases) and actual dietary practices.^{2–6} Data on knowledge, perceptions, and behavior regarding CVD and obesity among African Americans are limited. Therefore, to inform community interventions aimed at reducing CVD risk in this population, the purpose of this study was to determine the relationship of demographics to opinions and knowledge of CVD, hypertension, obesity, and dietary intake and to evaluate the relationship of dietary knowledge and dietary behaviors in rural African American adults.

METHODS

Setting and Sample

All eligibility criteria were self-reported. Participants had to be African Americans 21–75 years of age with a history of high blood pressure or high cholesterol. Participants had to report an interest in health and nutrition education programs and generally good health. Persons who were current smokers or who drank alcohol were excluded. These groups (smokers and drinkers) were excluded because their behavior may have overtly influenced their food choices. The taste perceptions of these groups may have been impaired.^{7–8} A total of 127 participants were recruited

from the municipal complex, grocery stores, churches, extension services, and the local utilities department of the city of Tuskegee, Alabama. Other recruitment methods included radio and newspaper advertisements and brochures and promotional materials.

Each participant was required to sign an informed consent as affirmation of his or her willingness to complete the questionnaire and to allow the data to be used anonymously. Each participant's informed consent and questionnaire were given the same code number and filed separately to ensure anonymity during the input and analysis of data. The Tuskegee University Human Subjects Review Committee approved the survey instrument for administration in Macon County and surrounding areas.

Measures

As part of the NUTRIFOODS study within the Alabama Collaboration for Cardiovascular Equality, attendees at community informational seminars in Macon County and surrounding areas in 2005 were asked to complete a newly developed 79-item questionnaire that addressed their knowledge of diet and chronic disease associations, perceptions of the impact of selected chronic diseases, and the prevalence of selected eating behaviors.

Demographic variables included sex, age, race/ethnicity, education, income, employment status, marital status, and number of children. Participant knowledge was measured by using items aimed at determining agreement with statements about obesity and heart disease, by recording participants' current knowledge and desire for more knowledge, and assessing participants' understanding of the relationship between obesity and disease. All three of these components were measured on a five-point Likert-type scale. Knowledge was also assessed by using a set of true/false questions. In the behavioral component of the questionnaire, participants were questioned on the frequency of certain eating habits. Finally, perception was measured by

assessing participants' opinions of the impact of health-related problems in men and women. The questionnaire had adequate internal reliability, exhibiting Cronbach alphas of .82, .69, and .92 for the knowledge, behavior, and perception components, respectively. The predictive validity of the questionnaire was evidenced by the expected (and observed) significant associations between: 1) knowledge of the salt content of processed foods and the frequency of adding salt at the table and 2) having an excellent knowledge of effects of fat intake on heart disease and the frequency of consumption of low-fat dairy products.

As mentioned, agreement with statements about obesity and heart disease was assessed by using a five-point Likert-type scale ranging from strongly disagree to strongly agree. We created a dichotomous variable by characterizing people as agreeing with the statement if they agreed or strongly agreed. Finally, we determined if this agreement or disagreement was consistent with current scientific opinion. Statistics and consensus reports from the American Heart Association; the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; and the National Heart, Lung, and Blood Institute provided the basis for scientific opinion on CVD, hypertension, obesity, and diet.⁹⁻¹¹

Data Collection

The questionnaire was administered prior to a three-part seminar series on CVD at different locations within each of two rural counties in Alabama: Macon and Bullock. All data entry was performed centrally by trained personnel. To ensure data quality, a 10% random sample was reentered. The disagreement rate between the two samples was 0.33%.

Statistical Analyses

Simple frequencies were used to summarize the demographic characteristics of the sample. To test the

relationship between demographic variables and agreement with current opinion on CVD and obesity, chi-square analysis was used; it was also used to test the association of sex, age, education, and income with knowledge and beliefs about health risk as they relate to obesity. Finally, assessment was made of whether knowledge and perceptions about diet and disease were congruent with eating behavior. In cases where chi-square testing sample size assumptions were not met, Fisher's exact test was used. All analyses were conducted with SAS version 9.0. Findings were considered significant at $P < .05$.

RESULTS

Of the 127 participants who completed the questionnaire, 82% were women and 18% were men. The largest number of participants came from the Tuskegee area. Groups at each seminar included individuals across the age range eligible for participation in the survey. Specifically, 18% of participants were 21-35 years of age, 29% were 36-50 years of age, 31% were 51-65 years of age, and 20% were ≥ 66 years of age. Participants were well educated, with 65% having at least some college or a college degree. Although 16% of participants did not answer or were not sure, 41% had an annual income $\geq \$25,000$.

Opinions Regarding Coronary Heart Disease, Obesity, and Diet

Significantly more women than men agreed with the statement "Heart disease kills more people in the United States than any other disease" (96.1% vs. 75.0%, respectively, data not shown). Older respondents (Table 2) were more likely to agree with this statement than their younger counterparts (100% for those ≥ 51 years of age vs 75% for those 21-35 years of age), and they also were more likely to agree with the statement "Heart disease causes

Table 1. Agreement with current scientific opinion regarding obesity, heart disease, and dietary intake, n (%)

| Current scientific opinion | Overall | Age (years) | | | |
|---|------------|-------------|------------|------------|-------------|
| | | 21-35 | 36-50 | 51-65 | ≥66 |
| Obesity is rising each year | 98 (95.2) | 14 (87.5) | 34 (97.1) | 31 (100.0) | 20 (90.9) |
| Overweight and obesity result when we eat more calories than we use | 97 (95.1) | 15 (93.8) | 32 (94.1) | 31 (93.9) | 20 (100.0) |
| Obesity is one of the causes of heart disease | 94 (95.9) | 16 (94.1) | 31 (93.9) | 33 (100.0) | 15 (93.8) |
| Heart disease kills more people in the US than any other disease | 86 (92.5) | 12 (75.0) | 29 (90.6) | 29 (100.0) | 17 (100.0)* |
| Reducing food intake alone will help one lose weight | 72 (64.9) | 9 (52.9) | 19 (51.8) | 28 (77.8) | 17 (73.9) |
| Heart disease causes include high blood pressure and high blood cholesterol | 92 (92.9) | 13 (86.7) | 30 (85.7) | 31 (100.0) | 19 (100.0)* |
| Overeating and lack of physical activity are the main causes of obesity | 93 (94.9) | 14 (87.5) | 32 (94.1) | 30 (96.7) | 18 (100.0) |
| Overeating and lack of physical activity are contributing factors to heart disease | 101 (97.1) | 16 (94.1) | 34 (100.0) | 32 (97.0) | 20 (95.2) |
| If you want to decrease caloric intake, you would cut back or limit what you eat daily | 63 (94.0) | 7 (77.8) | 26 (96.3) | 23 (100.0) | 7 (87.5) |
| Being overweight or obese is a potential health problem for chronic diseases | 111 (96.5) | 18 (100.0) | 34 (94.4) | 37 (97.4) | 23 (95.8) |
| Excess dietary salt may cause high blood pressure | 102 (90.3) | 15 (88.2) | 33 (94.3) | 35 (92.1) | 20 (83.3) |
| Processed foods usually contain more salt than non-processed foods | 104 (90.4) | 16 (88.9) | 32 (88.9) | 35 (92.1) | 22 (91.7) |
| Eating a minimum of 5 servings of fruits and vegetables per day can lower your blood pressure | 103 (89.6) | 16 (88.9) | 32 (88.9) | 33 (89.2) | 22 (91.7) |

* $P < .05$ for agreement within age.

include high blood pressure and high blood cholesterol” (100% for ages ≥ 51 years vs $\approx 86\%$ in ages 21–50 years). Finally, participants with the highest income compared to those at the lowest income level (97.5% vs 76.9%) were more likely to agree with the statement, “Processed foods usually contain more salt than non-processed foods.”

Personal Knowledge of Coronary Heart Disease, Hypertension, and Dietary Intake

Age was significantly associated with knowledge about the effects of fat intake and heart disease (Table 2). Specifically, age was positively correlated with both knowing more than the average person about and having an excellent knowledge of the effects of fat intake on heart disease. People with more education (greater than a high school education) were also more likely to report having an excellent knowledge of the effects of fat intake on heart disease (results not shown). Similar age associations were seen for the question “I know more than the average person about salt intake and high blood pressure.” There were also significant age and education associations on the questions on knowledge of both heart disease (education and age) and salt and high blood

pressure (education only) and whether these diseases were a concern to respondents. For age, in both cases, younger adults (21–35 years) were more likely to respond that they know a lot about these disorders, but they were less a concern to them than they were to older adults (≥ 36 years). Participants with less education (high school or less) were more likely to agree with the statement that they know a lot about heart disease, but it was not a concern to them (results not shown). More men than women (36.8% vs 12.9%, respectively) reported that they knew a lot about salt and high blood pressure, but it was not a concern to them (data not shown).

Health Risks Associated with Overweight/Obesity

Most participants believed that being overweight or obese increases the risk of high blood pressure, diabetes, heart disease, and cancer “a lot” however, more participants expressed no opinion on the association of obesity and cancer than for the other diseases (Table 3). Sex and age were not associated with beliefs about whether overweight and obesity increase a person’s risk for developing high blood pressure, diabetes, and certain types of cancer. However, those with more education were more likely to indicate that being

overweight or obese increases a person’s risk of developing heart disease “a lot” than were persons with less education (data not shown).

Dietary Knowledge and Behavior Regarding Salt Intake

No differences were observed in the frequency of consumption of salty snacks, fast food, or foods such as hot dogs and luncheon meats; frequency of purchasing convenience foods; or frequency of using salt at the table in those who indicated that they did or did not know that excess dietary salt may cause high blood pressure (Table 4). Knowledge that processed foods contain more salt than unprocessed foods was associated with decreased frequency of adding salt at the table. No significant associations were observed between the response to the question “I know more than the average person about salt intake and high blood pressure” and the frequency of adding salt at the table, purchasing convenience foods, and consuming foods such as chips, crackers, hot dogs, bologna, and luncheon meat. Those who answered affirmatively to the question “I know a lot about salt and high blood pressure, but it is not a concern to me” were more likely to add salt at the table and consume hot dogs and luncheon meats more frequently.

Table 2. Agreement with statements of personal knowledge of heart disease, hypertension, and dietary intake, n (%)

| Statement | Overall | Age (years) | | | |
|---|------------|-------------|-----------|-----------|------------|
| | | 21-35 | 36-50 | 51-65 | ≥66 |
| "I would like to learn more about heart disease" | 97 (91.5) | 17 (94.4) | 30 (93.8) | 32 (94.1) | 19 (82.6) |
| "I know more than the average person about fat intake and heart disease" | 64 (59.3) | 13 (72.2) | 14 (42.4) | 28 (75.7) | 10 (47.6)* |
| "I have an excellent knowledge of the effects of fat intake on heart disease" | 67 (60.4) | 13 (76.5) | 16 (45.7) | 27 (73.0) | 12 (52.2)* |
| "I know a lot about heart disease, but it is not a concern to me" | 19 (17.0) | 6 (33.3) | 5 (14.3) | 2 (5.4) | 6 (26.1)* |
| "I would like to learn more about salt and high blood pressure" | 101 (91.8) | 17 (100.0) | 33 (91.7) | 32 (91.4) | 20 (87.0) |
| "I know more than the average person about salt intake and high blood pressure" | 62 (55.9) | 13 (72.2) | 12 (34.3) | 26 (72.2) | 12 (52.2)* |
| "I know a lot about salt and high blood pressure pressure, but it is not a concern to me" | 19 (17.0) | 9 (50.0) | 4 (13.9) | 2 (5.6) | 3 (13.0)* |

* *P* < .05 for agreement within age.

Dietary Knowledge and Behavior Regarding Fruit and Vegetable and Fat Intake

No association was seen between the responses to the question "Eating a minimum of five servings of fruit and vegetables can lower your high blood pressure" and the number of servings of fruit or vegetables consumed daily (Table 5). Participants who indicated having an excellent knowledge of the effects of fat intake on heart disease were more likely to consume three or more servings a week of low-fat or skim milk, yogurt, and cheese than were those who reported that they did not have such knowledge (Table 6).

DISCUSSION

In this study, we found that age was associated with knowledge of the association of diet with disease and that knowledge of diet and disease associations did not necessarily translate into appropriate eating behavior. Raine¹² suggested that nutrition knowledge is intertwined with perceptions of healthy eating. Perceptions of healthy eating can be considered as one of the many factors

influencing people's eating habits.¹³ Miller et al¹⁴ found that when using focus groups to understand health-related practices and perceptions of African Americans, participants expressed that their limited knowledge of nutrition hindered their ability to make appropriate dietary adjustments. In our study, the youngest age group and men indicated that they had appropriate knowledge about food intake and heart disease, but a lack of concern apparently had negative influences on their eating habits. Encouraging greater concern may foster better eating habits in these population groups.

Older respondents in this survey (51-65 years of age) tended to know more about the effects of fat intake and heart disease and reported knowing more than the average person about salt intake and high blood pressure than did their younger counterparts. Older hypertensive African Americans in a study of the Dietary Approaches to Stop Hypertension (DASH) diet tended to experience the greatest reduction in blood pressure.¹⁵ Speculation was that older respondents concerned about their health tended to learn more and have better compliance in intervention stud-

ies. Lahman and Kumanyika¹⁶ and Shatenstein et al¹⁷ reported that among seniors, higher awareness of nutrition and health was associated with better food and nutrient intakes.

In a study about knowledge, attitudes, and practices in an African American population,¹⁸ participants had a good basic knowledge of hypertension and knew that hypertension was associated with CVD. Authors also found that basic knowledge tended to be better in women than in men. Women also tended to have better specific knowledge about heart disease.

In our study, income and beliefs about obesity were associated with a person's risk for developing hypertension, diabetes, and certain other conditions. Ard et al,¹⁹ through focus group discussions, found that several participants felt that the general lack of money shifted the focus of many African Americans from health to day-to-day survival.

The responses of many younger respondents and men in our study indicate that they possessed knowledge about salt and its relationship with heart disease and hypertension, but it was not of concern to them. Generally, the reason for this may be related to younger people having a sense of immortality and also feeling that diseases occur more frequently in older people. Additionally, knowledge about the salt content in processed vs unprocessed foods and increased frequency in their consumption provides the basis for creating an understanding that salt in the shaker compares to salt in food. This

Table 3. Beliefs about health risks associated with overweight/obesity n (%)

| Being overweight or obese increases a person's risk for developing ... | Increases | | Increases a little | Does not increase | No opinion |
|--|-----------|-----------|--------------------|-------------------|------------|
| | a lot | Increases | | | |
| High blood pressure | 82 (71.3) | 19 (16.5) | 1 (0.9) | 4 (3.5) | 9 (7.8) |
| Diabetes | 81 (71.1) | 17 (14.9) | 3 (2.6) | 4 (3.5) | 9 (7.9) |
| Heart disease | 82 (71.3) | 14 (12.2) | 5 (4.4) | 5 (4.4) | 9 (7.8) |
| Cancer | 61 (53.5) | 15 (13.2) | 8 (7.0) | 7 (6.1) | 23 (20.2) |

Table 4. Associations between dietary knowledge and behavior regarding salt intake, n (%)

| Dietary behavior | Dietary knowledge | | | | | | | |
|--|---|-------|--|-------|---|-------|---|-------|
| | Excess dietary salt may cause high blood pressure | | Processed foods usually contain more salt than non-processed foods | | I know more than the average person about salt intake and high blood pressure | | I know a lot about high blood pressure, but it is not a concern to me | |
| | Yes | P | Yes | P | Yes | P | Yes | P |
| How many times a week do you eat regular snack chips or crackers? | | | | | | | | |
| None | 17 (85.0) | | 20 (100.0) | | 11 (55.0) | | 4 (20.0) | |
| One | 35 (94.6) | | 36 (97.3) | | 20 (57.1) | | 3 (8.6) | |
| Two | 26 (86.7) | | 24 (77.4) | | 17 (56.7) | | 4 (13.3) | |
| Three or more | 24 (92.3) | .5754 | 24 (88.9) | .0159 | 14 (53.9) | .9941 | 8 (29.6) | .1687 |
| How many times a week do you eat fast food meals or snacks? | | | | | | | | |
| None | 21 (91.3) | | 21 (91.3) | | 14 (63.6) | | 3 (14.3) | |
| One | 31 (91.2) | | 32 (91.4) | | 17 (50.0) | | 2(5.6) | |
| Two | 26 (96.3) | | 26 (96.3) | | 17 (65.4) | | 6 (22.2) | |
| Three or more | 23 (85.2) | .5771 | 23 (82.1) | .3835 | 14 (51.9) | .5468 | 8 (28.6) | .0881 |
| How many times a week do you purchase convenience foods? | | | | | | | | |
| None | 14 (82.4) | | 16 (94.1) | | 12 (80.0) | | 5 (31.3) | |
| One | 16 (88.9) | | 17 (89.5) | | 9 (50.0) | | 1 (5.6) | |
| Two | 19 (90.5) | | 19 (90.5) | | 10 (47.6) | | 5 (23.8) | |
| Three or more | 15 (87.5) | .9281 | 14 (87.5) | .9520 | 7 (46.7) | .1587 | 2 (12.5) | .2128 |
| How often do you eat foods such as hot dogs, bologna, luncheon meat, bacon, ham, or sausage? | | | | | | | | |
| None | 14 (87.5) | | 16 (100.0) | | 8 (61.5) | | 5 (33.3) | |
| One | 23 (95.8) | | 24 (96.0) | | 16 (64.0) | | 3 (12.0) | |
| Two | 16 (84.2) | | 16 (84.2) | | 7 (38.9) | | 1 (5.3) | |
| Three or more | 9 (75.0) | .2882 | 9 (75.0) | .0674 | 7 (58.3) | .3958 | 4(36.4) | .0502 |
| How often do you add salt at the table? | | | | | | | | |
| None | 55 (93.2) | | 59 (98.3) | | 34 (59.7) | | 4 (6.8) | |
| One | 19 (86.4) | | 17 (77.3) | | 12 (54.6) | | 4 (19.1) | |
| Two | 13 (92.9) | | 13 (92.9) | | 6 (46.2) | | 3 (21.4) | |
| Three or more | 13 (81.3) | .4117 | 13 (81.3) | .0046 | 9 (56.3) | .8432 | 7 (46.7) | .0024 |

research also provides partial justification for intervention programs to influence change in dietary patterns regarding salt, fat, and fruit and vegetable intake and to increase awareness about obesity and cardiovascular disease.

Limitations of this study include that it is a subpopulation and general-

izations to other groups cannot be made. The sample size for men was low; therefore, care must be exercised in the interpretation of the data for this group. Additionally, only healthy, non-smoking, nondrinking participants with an interest in health and nutrition education were used in an effort to

collect data on food intake that were not influenced by adverse behaviors. The lifestyle behavior of smokers and drinkers may overtly influence their food choices. The taste perceptions of these groups may be impaired. Finally, limitations of cross-sectional data apply here.

In summary, this survey revealed that knowledge and perceptions about diet, obesity, CVD, and hypertension in this sample varied according to such factors as age and sex. It also showed that knowledge of diet and disease associations did not always translate into appropriate dietary practices. Implications for future research are many. First, efforts should be made to increase the proportion of men who participate in such surveys. Second, efforts to further educate individuals about cur-

Table 5. Associations between dietary knowledge and behavior regarding fruit and vegetable intake, n (%)

| Dietary behavior | Dietary knowledge | |
|---|---|-------|
| | Eating a minimum of 5 servings of fruits and vegetables per day can lower your blood pressure | |
| | Yes | P |
| How many servings of fruits and vegetables do you eat each day? | | |
| None | 5 (100.0) | |
| One | 12 (80.0) | |
| Two | 33 (91.7) | |
| Three or more | 52 (89.7) | .4797 |

Table 6. Associations between dietary knowledge and behavior regarding fat intake, n (%)

| Dietary behavior | Dietary knowledge | | P |
|---|---|--|-------|
| | I have an excellent knowledge of the effects of fat intake on heart disease | | |
| | Yes | | |
| How many times a week do you eat fast food meals or snacks? | | | |
| None | 14 (60.9) | | .9680 |
| One | 21 (63.6) | | |
| Two | 17 (65.4) | | |
| Three or more | 16 (59.3) | | |
| How many times a week do you eat beans, chicken, or fish? | | | |
| None | 6 (60.0) | | .7881 |
| One | 9 (56.3) | | |
| Two | 18 (69.2) | | |
| Three or more | 34 (58.6) | | |
| How many times a week do you eat regular snack chips or crackers? | | | |
| None | 11 (55.0) | | .8487 |
| One | 20 (58.8) | | |
| Two | 19 (63.3) | | |
| Three or more | 18 (66.7) | | |
| How much margarine, butter, or meat do you use to season vegetables or put on potatoes, bread, or corn? | | | |
| None | 11 (61.1) | | .9685 |
| One | 19 (59.4) | | |
| Two | 20 (57.1) | | |
| Three or more | 14 (63.6) | | |
| How many times a day do you consume beef or pork? | | | |
| None | 16 (66.7) | | .1901 |
| One | 28 (56.0) | | |
| Two | 9 (47.4) | | |
| Three or more | 12 (80.0) | | |
| How much low-fat or skim milk, yogurt, and cheese do you eat in a week? | | | |
| None | 8 (80.0) | | .0293 |
| One | 6 (46.2) | | |
| Two | 6 (35.3) | | |
| Three or more | 21 (72.4) | | |
| How often do you eat foods such as hot dogs, bologna, luncheon meat, bacon, ham, or sausage? | | | |
| None | 9 (60.0) | | .8681 |
| One | 16 (64.0) | | |
| Two | 9 (52.9) | | |
| Three or more | 8 (66.7) | | |

[This study] also showed that knowledge of diet and disease associations did not always translate into appropriate dietary practices.

rent scientific knowledge of diet and disease risk are warranted, especially in younger persons, since changes in lifestyle have the greatest potential effect on long-term health in this group. Finally, a committed effort should be made to identify barriers preventing knowledge of diet and disease associations from being translated into appropriate eating behaviors that would reduce disease risk.

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